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| [Facility Name/Logo]    | **POLICY NAME** **Infection Prevention and Control in Dialysis** |
| **Policy Number**  |

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| **Section:**  |   | **Origin date:**  |   |
| **Owner:**  |   | **Effective Date:**  |   |
| **Approved by:**  |   | **Last Revised Date:**  |   |
| **Prepared by:**  |   | **Next Review Date:**  |   |

1. **Policy description**This policy describes the requirements for infection prevention and control practiced in inpatient dialysis.
 **Rationale/Purpose**

To protect inpatient dialysis patients and staff from the spread of infection.

1. **Policy** (*Facilities should personalize this to their facility.)*
2. **Definition of Terms** (*consider adding or removing specific information related to your hospital setting)*
	1. **Acute renal failure** is a sudden decline in kidney function that can range from minor to complete kidney function, often caused by another serious illness.
	2. **Chronic Kidney Disease (CKD)** is defined as abnormalities of kidney structure or function, present for ≥ 3 months, with implications for health. The kidneys become damaged over time and cannot clean blood as well as healthy kidneys. At least one marker of kidney damage or decreased glomerular filtration rate (GFR) must be present for ≥ 3 months. Patients with CKF often need to continue their dialysis treatments in the hospital.
	3. **End Stage Renal Disease (ESRD)** is a medical condition in which a person’s kidneys function at a level too low to sustain life without treatment by dialysis or kidney transplant.
	4. **Dialysis** is a therapy that replaces many functions of the kidney by removing metabolic waste products through a natural (peritoneum) or an artificial (hemodialyzer) semipermeable membrane.
	5. **Hemodialysis** is an intermittent process of removing toxins, excess fluid, and electrolytes from the blood through an artificial membrane enclosed in a dialyzer, using a dialysis machine.
	6. **Peritoneal Dialysis** is a treatment for kidney failure that uses blood vessels in the lining of the abdomen to filter fluid and toxins from the blood.
	7. **Continuous Renal Replacement Therapy (CRRT)** is a temporary type of dialysis that is typically done in the ICU for critically ill patients whose bodies cannot tolerate regular dialysis. It is used for hemodynamically unstable patients with acute kidney injury, allowing controlled fluid management and mitigating risks associated with rapid solute changes.
	8. **Central Vascular Catheter (CVC)** – A CVC can be inserted for immediate access to the bloodstream. A cuffed or non-cuffed catheter may be used; however, a tunneled, cuffed catheter is recommended if the catheter is expected to be in place for more than 3 weeks. The right internal jugular is the preferred access site.
	9. **Arteriovenous fistula** is a surgical anastomosis created between an artery and a vein to create a large vessel for cannulation and flow. The fistula is native to the person, has fewer access complications and has the lowest risk of infection.
	10. **Arteriovenous graft** is a synthetic graft used to create the anastomosis between an artery and a vein.
	11. **Anti-HBcAg** - Antibody to Hepatitis B core antigen
	12. **Anti-HBsAg** – Antibody to Hepatitis B surface antigen
	13. **Anti-HCV** – Antibody to Hepatitis C virus
	14. **EIA** – Enzyme immunoassay
	15. **HBV** – Hepatitis B Virus
	16. **HBsAg** – Hepatitis B surface antigen
	17. **HCV** – Hepatitis C Virus
	18. **HDV** – Hepatitis D Virus
	19. **HIV** – Human Immunodeficiency Virus
3. **Basic Policy**
	1. **Personnel**
		1. All healthcare personnel should adhere to Infection Control policies.
			1. Bloodborne Pathogen Exposure Control Plan
			2. Hand Hygiene
			3. Transmission-Based Precautions
			4. Medication Safety
	2. **Infection Control Measures for All Patients**
		1. Standard Precautions in the Dialysis Setting
			1. The use ofpersonal protective equipment (PPE) is required whenever it can be anticipated that a patient interaction may involve contact with blood or body fluids (fluid-resistant gown, face-shield, protective eyewear, mask, gloves). Exposure risk activities include initiation and termination of dialysis, and cleaning used equipment. Each dialysis station should have PPE readily accessible.
			2. Gloves are required when caring for a dialysis patient or touching the dialysis equipment when dialysis is in process.
			3. PPE is removed following patient interaction and before leaving the patient area to prevent transmission risks. Change PPE between each patient interaction.
		2. Hand Hygiene
			1. Handwashing sinks must be clearly labeled and dedicated to handwashing.
			2. Hospital-approved hand sanitizing products are essential to have at point of use throughout the Dialysis unit. Alcohol-based hand sanitizer should be at least 60% alcohol content and may be used to sanitize hands if hands are not visibly soiled.
			3. Hand hygiene is performed after glove removal, between patient contact, after touching blood, bodily fluids and contaminated items. Additionally, hand hygiene should be performed when moving from a contaminated task to a clean task.
		3. Staff Responsibilities for Vascular Access
			1. Only hemodialysis nurses and licensed nephrologists may access vascular devices used for hemodialysis.
			2. Meticulous aseptic technique shall be used when connecting and disconnecting catheters and during dressing changes.
			3. Use an alcohol-based chlorhexidine (>0.5%) solution during dressing changes for vascular access device. Povidone-iodine (preferably with alcohol) or 70% alcohol are alternatives for patients with chlorhexidine intolerancea.
			4. Identify and address barriers to replace non-tunneled CVCs with a tunneled vascular access device for patients requiring hemodialysis greater than 7 daysa.
		4. Injectable Medication Preparation
			1. Medications are delivered separately to each patient.
			2. Single-dose vials are preferred and are approved for use for a single patient only, for a single case, procedure or injection.
			3. Assign medications packaged as multi-dose vials to a single patient whenever possible.
			4. Multi-dose vials that are used for more than one patient should be kept and accessed in a clean medication preparation area away from immediate patient treatment areas. If a multi-dose vial enters an immediate patient treatment area, dedicate it for single patient use only.
			5. Unused medications or supplies (syringes, alcohol swabs, protection caps) taken to a patient station shall be discarded and not reused for other patients.
			6. Catheter hubs or needleless connectors are scrubbed for 10-15 seconds with an appropriate antiseptic after the cap is removed and before accessing. Perform every time the catheter is accessed or disconnected.
		5. Patient Care Supplies
			1. Items taken to a dialysis station, including those placed on top of the dialysis machine, should be dedicated to a single patient.
			2. Items that cannot be cleaned and disinfected (e.g. tape) should be dedicated to a single patient or disposed of if not fully used.
			3. Reusable items or equipment should be cleaned and disinfected per manufacturer’s instructions for use (MIFU) at the point of care before storing in a clean storage location.
			4. Clean items in storage should be accessed with clean hands only.
		6. Additional Guidelines for Peritoneal Dialysis
			1. Peritoneal dialysis machines are disinfected between patients per manufacturer’s instructions using an EPA-registered disinfectant.
			2. Discard all dialysis fluid by emptying into a hopper, toilet or drain used for hemodialysis. Perform hand hygiene after handing contaminated fluids.
		7. Additional Guidelines for Hemodialysis on Acute Care Units
			1. Ideally, hemodialysis should be performed in the dialysis unit. If it must be performed in a patient room, the patient must be in a private room.
			2. Bedside or portable hemodialysis may be done in the patient room using a portable reverse osmosis (RO) water treatment system. The water and dialysate used for a portable treatment must meet AAMI guidelines. The water source may be from a hand washing sink.
				1. If the handwashing sink is used, alternative options for hand hygiene should be made available for hand hygiene.
			3. The machine may drain into a sink or commodec. The discharge tubing must not touch the water. The tubing should be secured to maintain a gap and prevent backflow, contact, and splatter.
4. **Guidelines for Transmission-Based Precautions (TBP)**
	1. There should be adequate space between stations (e.g., 6 feet minimum) to allow for staff movement, and to prevent transmission and cross contamination.
	2. If a patient on Contact Precautions must receive treatment in the Dialysis Unit, the patient should be placed in an isolation room, if available, or consider dialyzing the patient at a station with as few adjacent stations as possible.
	3. If a patient on Droplet Precaution must receive dialysis, the patient should preferably be hemodialyzed in their inpatient room. If the patient must be treated in the Dialysis Unit and no isolation room is available, the patient should be dialyzed at the end of the shift. Patients must be a minimum of 6 feet away from other patients and wear a surgical mask for the duration of their stay on the unit. Staff should follow Droplet Precautions and wear a surgical mask when caring for the patient.
	4. Inpatients on Airborne Precautions will preferably be hemodialyzed in their inpatient room AIIR. They must be placed in an Airborne Infection Isolation Room (AIIR) for treatment.
	5. Curtains should remain closed on either side of the patient while on transmission-based precautions. The treatment room must be labeled with the appropriate TBP signage.
	6. After completion of treatment, the exterior of the dialysis machine, environmental surfaces, and reusable equipment are cleaned in the same manner as specified in general cleaning.
5. **Cleaning, Disinfection and Care of Equipment**
	1. **Surface Cleaning and Disinfection**
		1. Prior to disinfection of the dialysis station, all visible blood and soil must be removed and cleaned using an intermediate level disinfectant. Blood tubing removed from the dialysis machine and the priming bucket (if present) should be emptied. Single-use supplies should be discarded. Reusable mobile equipment (e.g. blood pressure cuff, clamps, infusion pumps) should be cleaned, disinfected and stored.
		2. Environmental surfaces of the dialysis station should be cleaned and disinfected with an EPA-registered disinfectant after each patient treatment according to MIFU. Environmental surfaces include dialysis bed or chair, countertops, and external surfaces of the dialysis machine including the back of the dialysis machine, including containers associated with prime waste. Cleaning is performed while no patient is at the station.
	2. **Internal Disinfection of Dialysis Machines**
		1. At the end of the day, the internal fluid pathways of each machine are disinfected with heat or bleach solution per MIFU and Dialysis Unit policy.
		2. If fluid such as water or dialysate is permitted to sit in the machine overnight, the internal pathways must be disinfected prior to the first patient use the next day.
		3. Primed hemodialysis set-ups should be discarded after 12 hours if the treatment has not been initiated.
	3. **Wall Boxes**
		1. The wall box is the recess in the wall where the connections for treated water, acid and base concentrates, and the waste drain are located. The connections, hoses and surfaces of the wall box should be disinfected daily or more frequently if visibly soiled.
6. **Screening and Immunization**
	1. **Serologic Testing for Peritoneal Dialysis Patients**
		1. The CDC has no recommendations for serological screening for peritoneal dialysis patients.
	2. **Routine Serologic Testing for Hemodialysis Patients**
		1. Serologic screening is a vital part of an IPC program as it helps to identify disease early and prevents transmission.
		2. Patient screening is recommended prior to hemodialysis initiation.
		3. Routine testing for HBV and HCV is recommended.
		4. *Screening recommendations change periodically as medical technology and treatments advance, therefore seek evidence-based recommendations to update this section prior to policy updates.*
	3. **Hepatitis B Vaccination**
		1. Hepatitis B vaccine series is recommended for all susceptible chronic hemodialysis patients according to the most recent CDC/Advisory Committee on Immunizations Practices (ACIP) recommendations.
	4. **Hemodialysis Staff**
		1. Hepatitis B vaccine series is offered to all staff with reasonably expected exposure to blood or other potentially infectious body fluid.
		2. Routine testing for staff members is not recommended except when required to document the response to hepatitis B vaccination.
7. **Prevention and Management of HBV Infection**
	1. Isolation of Hepatitis B Virus (HBV) positive patients in a private room or other area separated from HBV-susceptible patients is required.
		1. Isolate patients who test positive for HBV surface antigen.
	2. The isolation room or area should have dedicated staff, equipment, medications, and supplies that are not used by HBV-susceptible patients. Machines used to treat an HBsAg-positive patient will be dedicated to the patient and labeled with their name, MRN, isolated from other machines during storage and kept only for the same patient’s treatment until their discharge from the hospital. See Dialysis Department policy for procedures and protocols.
	3. Vaccinate susceptible patients and staff against hepatitis B.
	4. Perform surveillance for infections and other adverse events.
8. **Prevention and Management of HCV Infection**
	1. Strict adherence to standard infection prevention practices can prevent transmission of HCV within the dialysis environment.
	2. Isolating HCV-infected hemodialysis patients or using dedicated dialysis machines for HCV-infected patients is not currently recommended according to recent guidelines.f
9. **Prevention and Management of HIV Infection**
	1. Routine testing of hemodialysis patients for HIV infection for infection prevention purposes is not recommended. Testing for HIV should be patient specific and based on additional risk factors.
10. **Surveillance**
	1. Records are maintained for each patient, including the location of the dialysis station, machine number used for each dialysis session and the name of staff member who connected and disconnected the patient to and from a machine.
	2. Notify the IPC department for suspected cluster of infections or adverse events associated with viral transmission risks.
	3. The IPC department performs surveillance in accordance with the IPC plan (*which includes CLABSI, etc.)*
11. **Hemodialysis Water Monitoring**
	1. Water systems and distribution systems should be disinfected to prevent growth and accumulation of gram-negative bacteria and endotoxins.
	2. The Association for the Advancement of Medical instrumentation (AAMI) and CDC guidelines provide chemical and microbiologic standards and testing recommendations for allowable and actionable threshold levels of water contaminants, bacterial cell counts and endotoxinsa.
		1. The AAMI Standards address:
			1. Equipment and processes used to purify water for the preparation of concentrates and dialysate and the reprocessing of dialyzers for multiple use.
			2. Devices used to store and distribute this water.
		2. Reference:  AAMI RD52:2004 (Minimum regulatory requirement)

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| Allowable water Total Viable Count (TVC) | Action level water Total Viable Count (TVC) | Allowable Level water Endotoxin Unit (EU) | Action Level water Endotoxin Unit (EU) |
| <200 | ≥50 | <2 | ≥1 |

* 1. Bacteriologic assays of water and dialysis fluids are performed at least once a month and during outbreaks.
	2. See Dialysis Policy for equipment disinfection protocols, testing frequency, and required interventions based upon results. Equipment disinfection and bacteriologic testing policy is adherent to MIFUs, regulatory requirements and CDC guidelines.
	3. The Infection Preventionist will be notified within 48 hours of culture results that fall above the action level.
	4. Water culture and endotoxin data, including any interventions, are reported to the IPC department \_\_\_\_\_\_(frequency) and reported to the ICC committee \_\_\_(frequency).
1. **Education**
	1. Infection prevention education, including OSHA Bloodborne Pathogen Exposure Plan and TB training, must be provided upon hire, annually, and if lapses or gaps in practice are identified.
	2. The facility’s competency program should cover the CDC Core Interventions for Dialysis Bloodstream Infection (BSI) Prevention to improve care and reduce bloodstream infections. Train staff on vascular access and aseptic technique. Perform competency evaluation for device access and catheter care skills upon hire and every 6-12 months.
2. **Audit and feedback**
	1. Routine audits of core hemodialysis interventions should be performed by Dialysis Department leadership or designee regularly. Frequent (e.g,. weekly to monthly) audits should be performed to document practice consistent with policy. The frequency of audits may be reduced following validation of consistent practice. Observations include:
		1. Hemodialysis hand hygiene
		2. Catheter connection and disconnection
		3. Hemodialysis CVC Scrub-the-Hub Protocol
		4. Hemodialysis Catheter Exit Site Care
		5. Arteriovenous Fistula and Graft Cannulation and Decannulation
		6. Dialysis Station Routine Disinfection
		7. Hemodialysis injectable medication preparation
	2. *Describe how audits are performed*
	3. *Delineate who can perform audits, required training*
	4. Discussion of the audit results and reinforcement of best practices should be shared regularly with the staff.
3. **Documentation**
4. **Responsibilities**
	1. *Describe accountabilities for monitoring and success of infection prevention in dialysis.*
	2. *Describe accountability for failure to comply with infection prevention policies in dialysis. (may be reflected in other disciplinary policies)*
5. **Responsible for content**
	1. Infection Prevention & Control, Dialysis Unit Manager
6. **References**
	1. Dialysis safety: Best Practices for Bloodstream Infection Prevention in Dialysis Setting. CDC. Published March 2024, accessed October 2024. <https://www.cdc.gov/dialysis-safety/hcp/clinical-safety/index.html>
	2. Dialysis safety: Core Dialysis Interventions Audit Tools and Checklists. CDC. Published March 2024, accessed October 2024. <https://www.cdc.gov/dialysis-safety/hcp/tools/index.html>
	3. APIC Implementation Guide: Infection Prevention and Control in Dialysis Settings. Published March 2022. <https://apic.org/professional-practice/implementation-guides/>
	4. Karkar A. Infection control guidelines in hemodialysis facilities. Kidney Res Clin Pract. 2018 Mar;37(1):1-3. Doi: 10.23876/j.krcp.2018.37.1.1. Epub 2018 Mar 31. PMID: 29629271; PMCID: PMC5875570.
	5. Fabrizi F, Cerutti R, Messa P. Updated Evidence on the Epidemiology of Hepatitis C Virus in Hemodialysis. Pathogens. 2021 Sep 7;10(9):1149. doi:10.3390/pathogens10091149. PMID: 34578181; PMCID: PMC8468134.
7. **Related policies**
	1. Bloodborne Pathogen Exposure Control Plan
	2. Tuberculosis Infection Control Plan
	3. Hand Hygiene Policy
	4. Prevention of Central Line Associated Blood Stream Infection policy
	5. Standard & Transmission-Based Precautions Policy
	6. Injection Safety
	7. Cleaning & Disinfection policy
8. **Approval Signatures**