

<b>Section:</b> UTMB On-line Documentation	<b>02.06 – Policy</b>
<b>Subject:</b> Infection Control & Healthcare Epidemiology Policies and Procedures	<b>12.11.18- Revised</b>
<b>Topic:</b> 02.06 - Dialysis	<b>1977 - Author</b>

## 02.06 - Dialysis

Purpose	To outline infection control guidelines for the practice of hemodialysis and peritoneal dialysis at UTMB
Audience	All those who participate in the hemodialysis and peritoneal dialysis procedures
Employees	<ul style="list-style-type: none"> <li>• Universal Precautions shall be followed when providing care to all patients.</li> <li>• Eating and drinking shall be confined to designated areas.</li> <li>• Personnel shall comply with the Employee Health Center guidelines for their areas.</li> <li>• Suspected or known exposure to or acquisition of a communicable disease shall be reported to the Department of Infection Control &amp; Healthcare Epidemiology or the Employee Health Center. All needle sticks shall be reported to the Employee Health Center.</li> <li>• Personal protective equipment (PPE) shall be worn for initiating and discontinuing hemodialysis and anytime exposure to body fluids is anticipated. If clothing becomes soiled by blood and/or body fluids, it shall be changed immediately.</li> <li>• During the dialysis procedure, gloves shall be worn when touching or manipulating the patient's fistula, shunt or intravenous catheter IV tubing, or any patient's body fluids (i.e., vomitus, stool, urine, blood). Gloves shall also be worn when touching the dialysis machine (i.e., knobs, buttons, tubing, clamps, changing transducers or cleaning the machine).</li> <li>• Hand hygiene shall be performed before and after each patient contact and after removal of gloves (see policy: Hand hygiene for All Hospital Employees).</li> <li>• Healthcare workers shall wash hands, don gloves and refrain from touching environmental surfaces prior to giving injections.</li> <li>• All ancillary personnel who interact with patients but do not provide hands on patient care (i.e., social workers, teachers, and dietitians) shall wash their hands when entering and leaving the dialysis area.</li> <li>• All cuts and lacerations shall be covered with a waterproof dressing (i.e., Op-Site).</li> <li>• Blood and other specimens such as peritoneal fluid shall be handled with care using Universal Precautions.</li> <li>• Linen shall be handled appropriately (see policy: Guidelines for</li> </ul>

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Handling Linen).

- Environment
  - The environment shall be thoroughly cleaned between each treatment and as necessary for spills of blood and body fluids.
  - Waste receptacles shall not be overfilled.
- Equipment
  - Dialysate and the water used to prepare the dialysate shall be cultured at least once a month according to the nursing service policy on Water Quality for Hemodialysis.
  - The following standards shall be followed for dialysis fluid.

Microbiologic and Endotoxin Standards for Hemodialysis Fluids				
Type of Fluid	Microbial count (CFU/ml)	Microbial Count (CFU/ml) Action Level	Endotoxin Count (EU/ml)	Endotoxin Count (EU/ml) Action Level
Water used to prepare dialysate	< 200	50	< 2	< 1
Dialysate	< 200	50	< 2	< 1

Bacterial culture surveillance results shall be reported to Infection Control & Healthcare Epidemiology via the renal QM meetings.

- Sampling of water and dialysate will be performed in accordance with the facility's independent third party laboratory. Refrigerated samples stored in a refrigerator will be in accordance with Infection Control & Healthcare Epidemiology's Policy 01.04 - Care and Monitoring of Refrigerators and Freezers.
- Pressure isolators or transducer filters shall be used to prevent blood contamination of arterial and venous pressure monitors. These isolators or filters shall not be reused.
- Dialyzers shall not be reprocessed.
- Between each patient the external surfaces of the dialysis machine shall be disinfected with an EPA-registered tuberculocidal (hospital-grade) disinfectant.
- Give special attention to cleaning central panels on the dialysis machine and other surfaces that are frequently touched and potentially contaminated with the patient's blood.
- Discard all fluid and clean and disinfect all surfaces and containers associated with the prime waste (including buckets attached to the

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machines) between each patient.

- The internal fluid pathway of the dialysis machine shall be disinfected the morning of every treatment day (according to manufacturer's directions) and regular cultures will be taken of the dialysate to ensure that the bacterial level in the dialysate is acceptable. Also a weekly chemical disinfection with sodium hypochlorite will be completed.
- The disinfectant for dialysis machines shall have contact with parts of the machine that are exposed to water or dialysis fluid.
- If the machine is to be removed from the dialysis area, the drain line shall be removed from the drain and placed into a plastic bag for transportation.
- A dedicated dialysis machine shall be used for patients known to be HBsAg-positive while the patient is hospitalized.
- If it is not possible to dedicate a machine for use on HBsAg(+) positive patients, the machine shall be decontaminated by cleaning all external surfaces with soap and water followed by application of a disinfectant (according to manufacture's directions) prior to use on another patient.
- A sterile hydrophobic transducer protector must be placed on each pressure fitting before connecting the pressure line to it. Otherwise, blood may enter the pressure monitor, causing disinfection problems and possible cross-contamination between patients. Replace the transducer protector between patients.

**Recommended steps to be taken to minimize risk of cross-contamination:**

- Always use an external transducer protector and utilize pressure alarm capabilities as indicated in the manufacturer's instruction.
- If the external transducer protector becomes wetted, replace it immediately and inspect it. If fluid is visible on the side of the transducer protector that faces the machine, have qualified personnel open the machine and check for contamination after the treatment is completed. If fluid is visible on the side of the transducer protector that faces the machine, the medical director should be notified. This check is to include the internal pressure tubing set and pressure sensing port.
- Frequent bloodline pressure alarms or frequent adjusting of blood drip chamber levels may be an indicator.

Patients

**Selection of Hemodialysis Catheter**

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- Use cuffed central venous catheters for hemodialysis if the period of temporary access is anticipated to be >1 month.

### **Catheter and Catheter-site Care**

- General Measures
  - Use of hemodialysis catheters for other purposes (e.g., administration of fluids, blood/blood products, or parenteral nutrition) shall be restricted to circumstances where no alternative vascular access is feasible.
  - Catheter site care, including dressing changes, shall follow the same standards as outlined in Epidemiology IHOP Policy 01.18 *Intravascular Devices and Infusion Systems* and Nursing Policy 8.1.7. *Central Venous Site Care for Hemodialysis Patients*.
- Use maximum barrier precautions for catheter insertion (see policy: Guideline for Prevention of Intravascular Catheter-Associated Infections).
- Patient's supplies will be set up prior to treatment. All unused supplies will be discarded at the end of the treatment.
- All multi-dose vials shall remain in the medication area. They shall be maintained according to the Pharmacy Infection Control Policy. All medications including multi-dose vials taken to the bedside of a dialysis patient, shall be used exclusively for that patient, and shall not be returned to the medication area.
- All doses must be drawn-up by a licensed professional whose scope of practice includes administration of parenteral medications and knowledge of aseptic technique.
- All doses from a given vial should be drawn-up and administered within a 4-hour period.
- Only one vial of a given concentration of the medication should be opened and used by the administering professional at any given time. A second vial of the same medication must not be opened until the previous vial is discarded.
- Residual amounts of these medications (either in the vial or syringes) must never be pooled with medication from another vial or syringe. If a patient requires more medication than is in a single, drawn syringe, then medication from a separate vial should be drawn into a separate syringe for administration.
- Each facility must have in place a process monitoring (quality assurance) program which ensures compliance with these policies and procedures. These policies must include: a) recording data on infections in treated dialysis patients; and b) unannounced practice

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audits involving quality assurance staff observing performance of re-use techniques.

- Do not stock patient care supplies in the treatment rooms.
- Routine testing of dialysis patients or healthcare workers for HIV for purposes of infection control is not necessary.
- Patients with HIV infection need not be isolated from other patients.

Hepatitis:  
Employees

- Nurses, technicians, dieticians, social workers, resident physicians and faculty physicians shall be offered the Hepatitis B vaccine if not already known to be immune.
- Those who choose to decline the Hepatitis B vaccine must sign a “Hepatitis B Vaccine Declination Statement”. The statement will be filed in the employee’s health record.
- Once an employee develops anti-HBs, they need not be screened for Hepatitis B antigen or antibody in the future.
- If an employee is a vaccine non-responder or is susceptible, they must have an HbsAg and Anti-HBs drawn every six months.
- If an employee has chronic Hepatitis B infection (HBsAg-positive for at least six months) they must have an HbsAg test annually.
- The Employee Health Center shall communicate the results of each employee’s serological test for Hepatitis B surface antibody to the designated project coordinator in the Dialysis unit.
- Staff members who are anti-HBs negative shall not care for a patient with HBsAg.
- Staff members caring for HBsAg-positive patients should not care for HBV-susceptible patients at the same time (e.g., during the same shift or during patient changeover).

Hepatitis:  
Patients

- Patients shall be offered the Hepatitis B vaccine, prior to the first dialysis treatments using the vaccine manufactured for immunization of patients with renal failure.
- Test for anti-HBs 1-2 months after last dose.
  - If anti-HBs is negative, consider patient susceptible, revaccinate with an additional three doses and retest for anti-HBs.
  - If anti-HBs is positive, consider patient immune, and retest annually.
    - Give booster dose of vaccine if anti-HBs becomes negative and continue to retest annually.

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- Dialyze HBsAg-positive patients in a separate room using separate machines, equipment, instruments, and supplies.
- These machines must be dedicated to these patients for the duration of hospitalization.
- A patient who is admitted for treatment before results of an HBsAg test are known shall undergo treatment as if HBsAg tests were positive, except that such patients shall not be treated in the HBsAg isolation room, area, or on the designated HBsAg-positive machine.
- Separate areas for both hemodialysis and peritoneal dialysis shall be maintained for HBsAg-positive patients in order to decrease the risk of hepatitis B transmission.
- Patients with hepatitis C do not have to be segregated in a separate room or have a dedicated dialysis machine.
- Patients who are infected with hepatitis D virus shall be separated from other dialysis patients, especially those who are HBsAg-positive.

Negative  
Pressure  
Room  
Utilization

### **PRIORITIES**

**Patients with any of the following diagnoses or possible diagnoses must be dialyzed in the private/negative pressure room.**

- Patients with diagnoses or possible diagnoses that require Airborne Precautions
  - Tuberculosis
  - Chickenpox
  - Disseminated herpes zoster
  - Immunocompromised patient with localized herpes zoster (shingles)
- Influenza (laboratory confirmed or MD diagnosed)
- Hepatitis B (HBs Ag) or jaundice (until cause identified)

**If the private room is not occupied by a patient with a diagnosis from the above list, patients should be placed into the room according to the following priority list:**

1. Patients with open and draining wounds infected with *Staphylococcus aureus* or Group A streptococci (not contained by a dressing)
2. Patients with localized herpes zoster who are not immunocompromised

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3. Patients with unknown/pending hepatitis B status
4. Patients with VRE colonization/infection
5. Patients with diseases that require Contact Precautions
6. Patients that do not require isolation precautions

*Note: All patients should be cared for using Universal Precautions.*

**If a patient with the diagnosis or possible diagnosis of an infectious disease cannot be prioritized based on the above list, contact Epidemiology at x23192 during weekdays and by pager (409) 643-3133 at night and on weekends.**

### **MAINTAINING NEGATIVE PRESSURE**

- The monitor should always read a (-) negative number (call Epidemiology at extension 23192 to report a fault)
- The door will alarm if opened
- Close the door to stop the alarm
- If the door must remain open, press “silence alarm”
- Press “silence alarm” again to reactivate and close the door

### **CLEANING**

- The surfaces in the negative pressure room will be cleaned between each patient by housekeeping, using a hospital grade disinfectant.
- The medical equipment in the negative pressure room will be cleaned between each patient by the Dialysis staff using a hospital grade disinfectant.

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Quality Control Home Unit

- Infection Control & Healthcare Epidemiology shall monitor infection control activities for the home dialysis unit.
- Infection Control & Healthcare Epidemiology shall maintain a system to identify and track infections to allow identification of trends or patterns.
- Patients enrolled in the UTMB home dialysis program will be routinely tested for Hepatitis B and Hepatitis C (see table).

**Schedule for Routine Testing for Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Infections for Chronic Hemodialysis Patients**

Patient Status	On Admission	Monthly	Semiannual	Annual
All Patients	HBsAg,* Anti-HBc* (total), Anti-HBs,* Anti-HCV, ALT <sup>†</sup>			
HBV-susceptible, including nonresponders to vaccine		HBsAg		
Anti-HBs positive (≥10 mIU/mL), anti-HBc negative				Anti-HBs
Anti-HBs and anti-HBc positive		No additional HBV testing needed		
Anti-HCV negative		ALT	Anti-HCV	

\* Results of HBV testing should be known before the patient begins dialysis.

<sup>†</sup> HBsAg= hepatitis B surface antigen; Anti-HBc=antibody to hepatitis B core antigen; Anti-HBs=antibody to hepatitis B surface antigen; Anti-HCV=antibody to hepatitis C virus; ALT=alanine aminotransferase.

Primary Monitoring Elements

- Patients and employees
  - PPD skin testing for tuberculosis
  - Hepatitis B vaccinations and serologic tests for Hepatitis B (patients and employees)
- Infection surveillance



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- Bacteremia rate
  - Primary bacteremia with sepsis
  - Primary bacteremia without sepsis
- Pyrogenic reactions rate
- Peritonitis rate
- Severe access site infection rate (and tunnel site)
- Severe exit site infection rate
- Universal Precautions

Infection  
Definitions

Laboratory Confirmed Bloodstream Infection

- Patient has a recognized pathogen cultured from one or more blood cultures **and** pathogen cultured from blood is **not** related to an infection at another site.

**OR**

- The patient has at least one of the following:
  - Common skin contaminate (e.g., diphtheroids, **Bacillus** sp., **Propionibacterium** sp., coagulase-negative staphylococci, or micrococci) is cultured from two or more blood cultures drawn from separate sites
  - Common skin contaminate (e.g., diphtheroids, **Bacillus** sp., **Propionibacterium** sp., coagulase-negative staphylococci, or micrococci) is cultured from at least one blood culture from a patient with an intravenous line, and the physician institutes appropriate antimicrobial therapy

**OR**

- Patient  $\leq$  year of age has at least **one** of the following signs or symptoms: fever ( $>38^{\circ}\text{C}$ ), hypothermia ( $<37^{\circ}\text{C}$ ), apnea, or bradycardia **and** at least one of the following:
  - Common skin contaminate (e.g., diphtheroids, **Bacillus** sp., **Propionibacterium** sp., coagulase-negative staphylococci, or micrococci) is cultured from **two** or more blood cultures drawn from separate sites
  - Common skin contaminate (e.g., diphtheroids, **Bacillus** sp., **Propionibacterium** sp., coagulase-negative staphylococci, or micrococci) is cultured from at least one blood culture from a patient with an intravenous line, and physician institutes appropriate antimicrobial therapy

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- Access Site Infection
- The patient has a least one of the following:
    - Purulent fluid at the access site
    - Positive culture from the access site at surgery
    - Bacteremia with no identified source and no evidence of endocarditis

- Peritonitis
- Patient shall have two of the following:
    - Cloudy peritoneal fluid with 100 cells with  $\geq 50\%$  PMN's
    - Abdominal pain or tenderness
    - Microorganisms recovered from cultures of peritoneal fluid

- Graft Fistula Infection
- The patient has purulent drainage at involved vascular site.

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