INFECTION PREVENTION IN DIALYSIS

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OBJECTIVES:
- Describe the burden of BSIs in dialysis patients and the importance of preventing these types of infections
- Implement interventions to prevent BSIs among dialysis patients
- Access checklists and audit tools that can be used to improve compliance with infection prevention practices

BACKGROUND
  - 58% reduction from 2001-2009 in the burden of CLABSS in ICUs
  - 3,000-6,000 lives and $414 million healthcare costs saved
  - Majority of CLABSS now occurring outside of ICUs especially in outpatient dialysis clinics
  - BSIs in dialysis patients are a major cause of hospital admissions and mortality
  - Infection second only to cardiovascular disease as cause of death
  - 80% of ESBL2 patients initiate dialysis with a central line

BACKGROUND
- Dialysis patients with catheters susceptible to infections
  - ESRD patients have compromised immune system
  - Medical devices are pathways for pathogens to get into body
  - Dialysis patients have an increased risk for Staph. aureus colonization
  - Colonized dialysis patients have a 1.8-4.7 times increase in the rate of access-related BSIs

BACKGROUND
- Reductions in BSIs show that interventions and collaborative work!
- BSIs are preventable!
- CDC established a hemodialysis Collaborative to develop and implement key interventions in 2009
- Data from 17 participating centers were analyzed
  - Access-related bacteraemia (ARB) decreased 33% (p<0.001) during intervention implementation
  - ARB rates were 0.73 per 100 patient-months during the pre-intervention period
  - 0.42 per 100 patient-months during the post-intervention period

TOOLS AVAILABLE FROM CDC
- Continuing Education: 1-hour self-guided training course that reviews:
  - Infections that patients can get from dialysis
  - Infection control recommendations for outpatient hemodialysis healthcare workers, and
  - Educating your patients and their caregivers.
CORE INTERVENTIONS FOR ELIMINATING ACCESS-RELATED BACTEREMIA

- Surveillance for positive blood cultures, antimicrobial starts, and local site infections using NHSN
  - Conduct monthly surveillance for dialysis events and enter events into NHSN (now a CMS ESRD QIP rule).
  - Export data out of NHSN to determine facility rates and comparisons to national rates.
  - Facilities should actively share results with front-line providers.

CORE INTERVENTIONS

- Chlorhexidine for skin antisepsis
  - Use chlorhexidine (2% or greater) as the first line agent for skin antisepsis
  - Use friction and scrub for at least 30 sec
  - Allow CHG to completely dry prior to cannulation
  - Povidone-iodine, preferably with alcohol, is an alternative

CORE INTERVENTIONS

- Hand hygiene surveillance
  - Perform monthly hand hygiene audits with feedback of results.
  - Based on WHO five moments for hand hygiene adapted to dialysis.

DIALYSIS 5 MOMENTS

- Moment 1 - Prior to aseptic procedures
  - Prior to cannulation or accessing catheter
  - Prior to performing catheter site care
  - Prior to parenteral medication preparation
  - Prior to administering IV medications or infusions

DIALYSIS 5 MOMENTS

- Moment 2 - Prior to touching a patient
  - When moving from machine to patient
  - Prior to entering station to provide care to patient
  - Prior to contact with vascular access site
  - Prior to adjusting or removing cannulation needles

DIALYSIS 5 MOMENTS

- Moment 3 - After body fluid exposure risk
  - After exposure to any blood or body fluids
  - After contact with other contaminated fluids (e.g., spent dialysate)
  - After handling used dialyzers, blood tubing, or prime buckets
  - After performing wound care or dressing changes
DIALYSIS 5 MOMENTS

- Moment 4 - After touching a patient
  - When leaving station after performing patient care
  - After removing gloves
- Moment 5 - After touching patient surroundings
  - After touching dialysis machine
  - After touching other items within dialysis station
  - After using chair-side computers for charting
  - When leaving station
  - After removing gloves

HAND HYGIENE MONITORING

CATHETER CARE/ACCESS OBSERVATIONS

- Catheter care/access observations
  - Perform monthly audits of catheter care and accessing practices to ensure adherence to facility guidelines. This may include use of a mask while connecting and disconnecting catheters and during dressing changes.
CATHETER CARE/ACCESS OBSERVATIONS

Audit Tool: Arteriovenous Fistula/Graft CATHETER CARE and ACCESS OBSERVATIONS
(Use a "Y" when performed correctly, a "N" if not performed, and a "?” if not observed, leave blank)

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Worker: __________________________  Date: ____________  Supervisor: ________________

CATHETER CARE/ACCESS OBSERVATIONS

Patient education/engagement
- Provide standardized basic education to all patients including (but not limited to):
  - Care of vascular access (don’t scratch, bathing with access)
  - Signs/symptoms of infection
  - Hand hygiene
  - Cleansing vascular access prior to treatment
  - Instructions for access management when away from the dialysis unit
  - Basic infection control practices during cannulation process (to engage patients)

CORE INTERVENTIONS

Staff education and competency
- Provide regular training for staff on infection control topics, including care of access and aseptic technique.
- Perform evaluation of competency for skills such as catheter care and accessing at least yearly and upon hire.

CDC-recommended staff competencies
- Gloving and hand hygiene (all staff)
- Catheter dressing change technique
- Vascular access technique
- Safe injection/safe medication practices

CATHETER REDUCTION

- Incorporate efforts within the facility (e.g., patient education) to reduce catheters by identifying barriers to permanent vascular access placement and catheter removal.

CORE INTERVENTIONS

Supplemental Intervention: Antimicrobial ointments or Chlorhexidine-impregnated dressings
- Apply bacitracin/gramicidin/polymixin B ointment or povidone-iodine ointment to catheter exit sites during dressing change OR
- Use a chlorhexidine-impregnated dressing.
- Facilities that choose not to implement one of these interventions should reassess if rates do not reach target infection rates

SCRUB THE HUB PROTOCOL


Catheter Connection Steps
1. Perform hand hygiene and don new clean gloves.
2. Clamp the catheter
3. Disinfect the hub with caps removed using an appropriate antiseptic (alcohol or CHG)
SCRUB THE HUB PROTOCOL

Hub Disinfections Steps when Initiating Dialysis
1. Prior to cap removal, disinfect the caps and the part of the hub that is accessible.
2. Remove the caps and disinfect the hub with a new antiseptic pad for each hub.
3. Using the same antiseptic pad, apply antiseptic with friction to the catheter moving from the hub at least several centimeters towards the body. Hold limb and air dry.
4. Use a separate antiseptic pad for each hub/catheter limb. Limit time hubs are “open”.

Catheter Connection Steps
4. Always handle the catheter hubs aseptically. Once disinfected, do not allow the catheter hubs to touch nonsterile surfaces.
5. Attach sterile syringe, unclamp the catheter, withdraw blood, and flush per facility protocol.
6. Repeat for other limb (this might occur in parallel).
7. Connect the ends of the blood lines to the catheter aseptically.
8. Remove gloves and perform hand hygiene.

Catheter Disconnection Steps
1. Perform hand hygiene and don new clean gloves.
2. Clamp the catheter (Note: Always clamp the catheter before disconnecting. Never leave an uncapped catheter unattended).
3. Disinfect the catheter hub before applying the new cap using an appropriate antiseptic.
4. Always handle the catheter hubs aseptically.
5. Hold the catheter until the antiseptic has dried.
6. Attach the new sterile caps to the catheter aseptically. Use caution if tape is used to secure caps to the catheter.
7. Ensure that catheter is still clamped.
8. Remove gloves and perform hand hygiene.

Hub Disinfections Steps When Taking off Dialysis
a) Disinfect the connection prior to disconnection.
b) Disconnect the blood line from the catheter and disinfect the hub with a new antiseptic pad.
c) Thoroughly scrub sides and end of hub and use friction.

Cleaning and Disinfection
Refer to manufacturer’s specifications for product use.
If there is visible blood on any surface within the station, the blood must be cleaned with an EPA-registered disinfectant first and THEN disinfection of station can occur.
Disinfection of the station is a two-step process:
1. Removal of contaminated supplies
2. Disinfection of station
Best if 2nd step is completed AFTER patient has left the station.
PART 1: PREPARING STATION FOR DISINFECTION

1. Disconnect tubing and dialyzer and discard or transport in a leak-proof container for disposal or reprocessing
2. Discard all single-use supplies and move reusable supplies to utility area to be cleaned and disinfected
3. Remove all linens
4. Remove gloves and perform hand hygiene
   » Patient should be out of the station before proceeding to the next steps.

PART II: DISINFECTION OF DIALYSIS STATION

» Don a new pair of clean gloves.
» Empty and disinfect the priming bucket, allow to air dry
» Apply an EPA-registered disinfectant to all surfaces in the dialysis station using a wiping motion and friction
» Make sure all surfaces are wet for the contact time specified by the product manufacturer
» Allow surfaces to air dry
» Remove gloves and perform hand hygiene
» Wear clean gloves and set the station up for the next patient

INJECTION SAFETY

» Single-use injectable medications and solutions be dedicated for use on a single patient and be entered one time only.
» Medications packaged as multidose should be assigned to a single patient whenever possible.
» All parenteral medications should be prepared in a clean area separate from potentially contaminated items and surfaces.
» Proper infection control practices must be followed during the preparation and administration of injected medications.

GUIDING DOCUMENT FOR INFECTION PREVENTION IN DIALYSIS

» Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients. MMWR April 27, 2001/50(RR05):1-43

QUESTIONS?