July Core Intervention Assignment
(for the BSI QIA)

#6 Catheter Reduction
6. Catheter Reduction

Incorporate efforts (e.g., through patient education, vascular access coordinator) to reduce catheters by identifying and addressing barriers to permanent vascular access placement and catheter removal.
Catheter Facts

• In 2010, more than 380,000 patients in the United States relied on hemodialysis for treatment of their end-stage kidney disease. About 8 in 10 of these patients start treatment with a central line.

• CDC estimates 37,000 central line-associated bloodstream infections may have occurred in U.S. hemodialysis patients in 2008.

• A dialysis patient is more than 100 times more likely to get a bloodstream infection from a common resistant bacteria, methicillin-resistant Staphylococcus aureus, than other people.

Source: CDC
Questions to Review

• How many patients have catheters in your facility?

• Does each catheter patient have an access placement plan?
  o Have these access placement plans been followed through for each patient?
  o Does any of the data need updating?
  o Identify barriers for patients that have not or refuse to follow up for access placement evaluations.

• How many access infections has your facility had since January 2018?
  o How many of those access infections were catheter related?
How to View Your Access Related Bloodstream Infections in NHSN

NHSN Dialysis Event ARBSI Report Quick Reference

How to Create an NHSN Access Related Bloodstream Infection Report

1. From the navigation bar, select ‘Analysis’ and ‘Generate Data Sets’
   - **Analysis**
     - Generate Data Sets
     Generate new data sets; overwrite old ones – this ensures the report will be created using the most up-to-date data.

2. From the navigation bar, select ‘Reports.’ Open the following folders, in order:
   - **Dialysis Events**
     - Numerators
     - Denominators
     - Rates

3. Locate the report and click ‘Run Report’
   - **Rate Table - Access Related Bloodstream Infection**

   Optional: Click ‘Modify Report’ to customize the report to your needs.

On the Time Period tab, change the timeframe to the period of interest:

- **Time Period**
  - Data Variable: Beginning Ending
  - Enter Date variable/Time period at the time you click the Run button

Once modifications are made, scroll down and click **Run**

How to Read an NHSN Access Related Bloodstream (ARB) Infection Report

- The year and calendar quarter of the data (e.g., 2014Q1 is Jan, Feb, Mar 2014)
- The number (count) of Access Related Bloodstream Infections (ARB) at the facility
- The mean or average rate of Dialysis Event ARB for all of NHSN (per 100 patient-months)
- The facility’s percentile rank for ARB as compared to all of NHSN (lower is better)

<table>
<thead>
<tr>
<th>Access Type</th>
<th>Summary Yr/Qt</th>
<th>Months</th>
<th>Number Access Related Bloodstream Infections</th>
<th>Access Related Bloodstream Infection Rate/100 patient-months</th>
<th>Incidence Density p-value</th>
<th>Incidence Density Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fistula</td>
<td>2014Q1</td>
<td>3</td>
<td>0</td>
<td>0.00</td>
<td>0.7554</td>
<td>50</td>
</tr>
<tr>
<td>Graft</td>
<td>2014Q1</td>
<td>3</td>
<td>1</td>
<td>0.91</td>
<td>0.5455</td>
<td>82</td>
</tr>
<tr>
<td>Tunnelled</td>
<td>2014Q1</td>
<td>3</td>
<td>1</td>
<td>1.00</td>
<td>0.3559</td>
<td>30</td>
</tr>
</tbody>
</table>

- The vascular access type that applies to each row
- The number of months that had data in each quarter
- The number (count) of patient-months at the facility
- The rate of ARB at the facility (per 100 patient-months)
- The probability that the facility’s rate is statistically different than the rate for all of NHSN (a p-value less than 0.05 is usually considered statistically significant)

- NHSN Dialysis Event Access Related Bloodstream Infection: a positive blood culture with the suspected source identified as the vascular access site or uncertain.
- Dialysis event data are stratified by vascular access type because infection risk varies by type.
- Regularly share the data with front line staff to engage them in prevention.
Tunneled Catheters

Potential complications are:

- Malfunction due to mechanical causes like
  - Poor placement technique
  - Retraction with or without exposure of the cuff
  - Cracked hub or broken clamps
  - Thrombosis/Fibrin sheath formation

- Infection
  - Exit site
  - Tunnel infection

- Central vein stenosis

Early recognition is important to prevent:

- Loss of the vascular site if the catheter falls out

- Inadequate dialysis clearance

- Bacteremia- and sepsis-related morbidity and mortality

Source: Atlas of Dialysis Vascular Access | Tushar J. Vachharajani, MD, FASN, FACP
The next few slides depict common problems associated with tunneled catheters...
Fibrin Sheath

An intact fibrin sheath pulled out along with the catheter. A fibrin sheath is a flimsy fibroepithelial tissue that extends from the cuff (A) to the tip of the catheter (B).
Intraluminal Thrombus

Fibrin sheath extending beyond the tip of the catheter and occluding it completely.

An organized thrombus occluding the tip of the catheter.

The organized clot has been extruded from the catheter.

Source: Atlas of Dialysis Vascular Access | Tushar J. Vachharajani, MD, FASN, FACP
Exposed Cuff

A: The cuff of the catheter is exposed at the exit site. The exit site should be evaluated prior to each dialysis session. A catheter with an exposed cuff can be easily pulled out and can lead to loss of a vital vascular access site. The exposed catheter cuff would also suggest that the tip is no longer at the proper location and delivery of blood through this catheter may not be adequate. The replacement of the catheter over a guide wire can be easily performed with proper anchoring and the patient can return for dialysis therapy on the same day.

B: Disrupted subcutaneous tunnel (arrowheads) with exposed catheter cuff at the exit site.

Source: Atlas of Dialysis Vascular Access | Tushar J. Vachharajani, MD, FASN, FACP
Tunnel Infection

A: Purulent fluid collection under the dressing suggestive of infection.

B: Purulent secretion, erythema over the tunnel and skin changes secondary to infection in the subcutaneous tunnel.

The catheter must be removed promptly for effective antibiotic therapy and morbidity reduction.
Suggestions to Reduce Catheters

• Dedicated, persistent team

• Vascular Access Manager

• Communication

• Education
  ○ All Staff
  ○ Patients