Monitoring Central Line-Associated Bloodstream Infection (CLABSI) Rates in Home Care

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National Home Infusion Association

www.nhia.org
Objectives

• Describe the implications of CLABSI surveillance in home care.
• Demonstrate how to implement and use CLABSI data collection in home care.

Audience Composition

- Home infusion pharmacy
- Home health agency
- Outpatient setting
- Inpatient setting
- Other practice settings

Home Infusion Pharmacy + Home Health Agency = Home Care
Healthcare Associated Infection (HAI)—A Brief History

- **1950’s**: Clinical pioneers began focusing on HAI control in hospitals
- **1960’s**: First formal hospital HAI control programs were initiated
- **1970’s**: Substantial growth in hospitals with formal HAI programs
- **1990’s**: Virtually every hospital was on board

- Hospitals built/managed their own programs, often without local public health dept input
- The U.S. Centers for Disease Control and Prevention (CDC) worked in these early hospitals to facilitate their HAI prevention programs
- CDC’s National Nosocomial Infection Surveillance program (NINS)—1st voluntary program for hospitals

Source: MMWR, 2011: [http://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a10.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a10.htm)
Creating a Mandate for HAI Surveillance in Hospitals

- CDC’s Study on the Effectiveness of Nosocomial Infection Control (SENIC), mid-1970’s
- The Joint Commission makes infection control programs an accreditation requirement for hospitals in 1976
- Institute of Medicine (IOM) report, *To Err is Human*, 1999
  - Revealed thousands of patients harmed or died in U.S. hospitals annually as a result of medical errors and HAI’s, many believed to be preventable
- Investigative reports in lay-press followed, engaging the public in the outcry for hospital transparency and action
- Tipping point reached with two studies in mid-2000’s on CLABSIs in the ICU that reported a roughly 65% reduction following implementation of an evidence-based “bundle” of interventions

Source: MMWR 2011, [http://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a10.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/su6004a10.htm)
Regulating HAI Surveillance

• State legislatures began mandating public reporting of HAIs
  – By 2014, 33 states had formal laws on the books
• 2008—Congress mandated the Centers for Medicare and Medicaid Services (CMS) stop paying for care associated with HAIs
• 2010—Congress incorporated HAI prevention into the Value Based Purchasing Program (VBPP) of the Affordable Care Act (ACA)
  • CLABSI and the Inpatient Quality Reporting (IQR) Program: hospital ICUs in Jan, 2011; hospital medical/surgical wards Jan, 2015 (and other inpatient facilities)

CLABSI Surveillance Requirements and Home Care

- Accreditation requirements
  - Address HAI in the home, including reporting via organizational quality improvement (QI) programs
- Professional standards of practice address HAI prevention and control
  - E.g., INS Infusion Therapy Standards of Practice (2016) apply to nursing practice in all care settings
- Published guidelines and research drives evidence-based clinical practice and outcomes monitoring

Eliminating CLABSI Through Best Practices

- INS Infusion Therapy Standards of Practice (2016)
- SHEA Compendium of Strategies to Prevent HAI in Acute Care Hospitals: 2014 Updates
- CDC Guidelines for the Prevention of Intravascular Infections (2011)
- IDSA Clinical practice guidelines for the diagnosis and management of intravascular catheter-related infection (2009, under review)
  - Ex: Standardizing Central Venous Catheter Care: Hospital to Home. 2012. NGC: 009348. The Nebraska Medical Center

STAYING CURRENT IN EVIDENCE-BASED PRACTICE REQUIRES CAREFUL ATTENTION TO PUBLISHED FINDINGS
INS Standard 6: Quality Improvement (QI)

- QI Programs include surveillance, aggregation, analysis, and reporting of infection; infection prevention practices; morbidity and mortality rates associated with infections; and both infusion-related patient quality indicators and adverse events to minimize health care-associated infections related to infusion therapy with clinicians taking action as needed to improve practice, processes and/or systems.

INS Standard 6—Practice Criteria

A. Foster a just culture and individual accountability

B. **Participate regularly in QI activities**

C. Analyze infusion therapy practice processes and outcomes to determine when remediation, additional education, or other performance improvement action is needed for clinician(s)

D. **Evaluate the incidence of CLABSI regularly by:**

   E. Evaluate adverse events from peripheral catheters, etc.

   F. Analyze technology analytics, such as smart pumps and bar-code medication administration, for errors, overrides, and other alerts so that improvements may be considered.

INS Standard 6—Practice Criteria B: Participating in QI

1. Using systematic methods and tools to guide activities;
2. Identifying clinical quality indicators and their benchmarks, such as CLABSI, CR-BSI, reasons for removal of a VAD, etc.;
3. Collecting data, analyzing and evaluating outcomes against benchmarks for areas of improvement;
4. Comparing outcomes to national databases;
5. Evaluating and reporting quality and safety indicator outcomes, etc.;
6. Recommending and implementing changes in structures or processes based on data;
7. Using cost analysis, cost-effectiveness, and other methods as indic.
8. Minimizing and eliminating barriers to change and improvement.
9. Sharing improvements, both internally and externally

D. Evaluate the incidence of CLABSI regularly by:

1. Using **consistent surveillance methods and definitions**
2. Using a **standard formula**
3. Comparing results to **benchmark data**
4. Reviewing each case for **root cause**
5. **Comparing rates** to historical internal data and external national rates (e.g., National Healthcare Safety Network [NHSN])
6. Regularly **reporting results** to clinicians and leaders, and as mandated

Use Consistent Surveillance Methods and Definitions

National Healthcare Safety Network (NHSN)

- CDC’s healthcare-associated infection (HAI) tracking system
- Started in 1970 as the National Nosocomial Infection Surveillance System (NNIS)
- Reorganized as NHSN in 2005, now serves 17,000 medical facilities
  - Home care not currently included in NHSN activities

Source: NHSN Surveillance for Bloodstream Infections, Device-associated Module
http://www.cdc.gov/nhsn/about-nhsn/index.html
CLABSI vs. CRBSI—Which Should We Use?

<table>
<thead>
<tr>
<th></th>
<th>Surveillance Definitions</th>
<th>Clinical Diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose:</strong></td>
<td>Identify trends within a population for prevention and research</td>
<td>Identify disease in, and treatment needs for, individual patients</td>
</tr>
<tr>
<td><strong>Components:</strong></td>
<td>Limited predetermined data elements</td>
<td>All diagnostic information available</td>
</tr>
<tr>
<td><strong>Clinical Judgement:</strong></td>
<td>Excluded if possible</td>
<td>Valued</td>
</tr>
</tbody>
</table>

**Bottom Line:** At times clinical judgement and surveillance definitions will not match. Surveillance definitions always “trump” in epidemiologic surveillance.
CLABSI vs. CRBSI

CLABSI—Surveillance

• Term used by the NHSN
• A CLABSI is a primary bloodstream infection that develops in a patient with a central line in place within the 2-day period before onset of the bloodstream infection, and that is not related to infection at another site
• Culturing the catheter tip or peripheral blood is not a criterion for CLABSI

CRBSI—Clinical Diagnosis

• A more rigorous diagnostic definition that requires specific laboratory testing to identify the catheter as the source of the bloodstream infection:
  – Positive semi-quantitative (>15 CFU) or quantitative (>103 CFU) culture whereby the same organism is isolated from the catheter segment and peripheral blood
  – Simultaneous quantitative blood cultures with a 5:1 ratio CVC vs. peripheral
  – Differential time-to-positivity of CVC culture vs. peripheral site

Sources: The Joint Commission, CLABSI Took Kit http://www.jointcommission.org/topics/clabsi_toolkit_introduction.aspx; and HICPAC Safe Care Campaign http://www.safecarecampaign.org/crbsi.html
CLABSI Surveillance is Just the Beginning

CLABSI Surveillance

Outcomes Measure Collection

Quality Improvement Processes
NHSN Definition of CLABSI

• A laboratory-confirmed bloodstream infection (LCBI) where central line (CL) or umbilical catheter (UC) was in place for >2 calendar days on the date of event, with day of device placement being Day 1 AND

  the line was also in place on the date of event or the day before.

• If a CL or UC was in place for >2 calendar days and then removed, the date of event of the LCBI must be the day of discontinuation or the next day to be a CLABSI

• If the patient is admitted or transferred into a facility with an implanted central line (port) in place, and that is the patient’s only central line, day of first access in an inpatient location is considered Day 1
  – “Access” is defined as line placement, infusion or withdrawal through the line
  – Such lines continue to be eligible for CLABSI once they are accessed until they are either discontinued or the day after patient discharge (as per the Transfer Rule)
  – Note that the “de-access” of a port does not result in the patient’s removal from CLABSI surveillance
NHSN Surveillance—The Devil is in the Details

Key concepts used to standardize definitions and processes for NHSN surveillance:

- Mapping patient care areas (acuity levels, type of service, etc.)
- Location of attribution and related HAI criterion
- Laboratory confirmed bloodstream infection (LCBI) event
- Date of event
  - 7-day infection window period
- Present on admission (POA) and Transfer rule
- 14-day Repeat infection timeframe (RIT)
- Secondary bloodstream infection attribution period
- Pathogen assignment guidance

Sources: [http://www.cdc.gov/hai/surveillance/index.html](http://www.cdc.gov/hai/surveillance/index.html)
<table>
<thead>
<tr>
<th>Hospital Day</th>
<th>Date of Event Assignment for RIT*</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 days before admit</td>
<td>Hospital Day 1</td>
<td>Present on Admission (POA)</td>
</tr>
<tr>
<td>1 day before admit</td>
<td>Hospital Day 1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Hospital Day 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Hospital Day 2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hospital Day 3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Hospital Day 4</td>
<td>Healthcare Acquired Infection (HAI)</td>
</tr>
<tr>
<td>5</td>
<td>Hospital Day 5</td>
<td></td>
</tr>
<tr>
<td>6-14</td>
<td>Hospital Days 6-14</td>
<td></td>
</tr>
</tbody>
</table>

*RIT= Repeat Infection Timeframe
Event = the date the first element used to meet the CDC NHSN site-specific infection criterion occurs for the first time within the seven day infection window.
Laboratory Confirmed Bloodstream Infection (LCBI)

**LCBI Criterion 1**
- Patient has a recognized pathogen identified from one or more blood specimens by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST))

**AND**
- Organism(s) identified in blood is not related to an infection at another site

**LCBI Criterion 2**
- Patient has at least one of the following signs or symptoms: fever (>38°C), chills, or hypotension

**AND**
- Organism(s) identified from blood is not related to an infection at another site

**AND**
- The same common commensal is identified from two or more blood specimens drawn on separate occasions, by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST))
LCBI Criterion 3—applies only to pts younger than one

- Patient ≤ 1 year of age has at least one of the following signs or symptoms: fever (> 38°C), hypothermia (< 36°C), apnea, or bradycardia

AND
- Organism(s) identified from blood is not related to an infection at another site (Secondary BSI)

AND
- The same common commensal is identified from two or more blood specimens drawn on separate occasions, by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST). Criterion elements must occur within the Infection Window Period, the 7-day time period which includes the collection date of the positive blood, the 3 calendar days before and the 3 calendar days after.
NEW in 2016: Mucosal Barrier Injury (MBI) LCBI—A Subset of LCBI 1, 2 and 3 Criterion

- Purpose of this additional LCBI “criterion” level:
  - To identify BSIs believed to be the result of the patient’s weakened immune state and accompanying alteration of the gut
  - To categorize these BSIs as primary in nature and not an infection at another site. The gut acts as the source of the colonizing organism.

- Eligible patient populations:
  - Allogeneic stem cell transplant recipients
  - Patients with severe neutropenia
**Also NEW in 2016—When an LCBI is **Not** a CLABSI**

<table>
<thead>
<tr>
<th>IF...</th>
<th>THEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation a patient may have/did access their own central line...</td>
<td></td>
</tr>
<tr>
<td>LCBI is <em>Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus or Pneumocystis</em>...</td>
<td>the positive LCBI is <strong>NOT</strong> a CLABSI</td>
</tr>
<tr>
<td>LCBI is <em>Salmonella sp.</em> ...</td>
<td></td>
</tr>
<tr>
<td>Patient has a central line in addition to one of the following</td>
<td></td>
</tr>
<tr>
<td>• Peripheral IV</td>
<td></td>
</tr>
<tr>
<td>• Arteriovenous fistula or graft</td>
<td></td>
</tr>
<tr>
<td>• Non-accessed central line</td>
<td></td>
</tr>
<tr>
<td>AND THE BSI CAN CLEARLY BE ATTRIBUTED TO THAT VASCULAR SITE (I.E., PUS AT INSERTION SITE AND MATCHING PATHOGEN FROM PUS AND BLOOD)...</td>
<td></td>
</tr>
</tbody>
</table>

*Giving credit where credit is due...or not, as the case may be...*
Collecting NHSN CLABSI Data—Numerator Data

- **FORM:** PRIMARY BLOODSTREAM INFECTION (BSI) (CDC 57.108)
- **EVENT TYPE:** BSI
- **RISK FACTORS:** CL (PERM OR TEMP), HEMODIALYSIS CATH, LOCATION/DATE OF DEVICE INSERTION
- **EVENT DETAILS:** CRITERIA USED (S/S FEVER, CHILLS, HYPOTENSION); UNDERLYING CONDITIONS FOR MBI-LCBI
- **PATHOGENS:** ORGANISM FROM LCBI AND ANTI-INFECTIVE USED TO TREAT IT
Collecting NHSN CLABSI Data—Denominator Data

• **DEVICE DAYS AND PATIENT DAYS ARE USED FOR DENOMINATORS**

• **MAY DIFFER ACCORDING TO THE PATIENT'S LOCATION**
  
  – **SPECIALTY CARE AREAS/ONCOLOGY (SCA/ONC) AND NICUS:** Count # of patients with one or more central lines, distinguishing permanent from temporary central lines on the Denominators for Specialty Care Area (SCA)/Oncology (ONC) form (CDC 57.117)

  – **All Other Areas:** Count # of patients with one or more central lines of any type, and record on the Denominators for Intensive Care Unit (ICU)/Other Locations form (CDC 57.118)

• Denominator data are **collected at the same time, every day, per location** (unit or ward)

• Only the totals for the month are entered into NHSN.
NHSN Denominator Data Collection Methods

Manual, Daily
- Collected same time every day of the month
- Forms CDC 57.117 or CDC 57.118

Manual, Sampled
- Collected same time, once per week
- Avoid Saturday and Sunday (less accurate)

Electronic
- Requires pre-validation: three months of side-by-side comparison to Manual Daily data
- Considered acceptable to use if not substantially different (±5%) from manual results
Sampling Method of Denominator Data Collection

- NHSN data entry requires:
  - Monthly total of patient-days, based on daily collection
  - Sampled total for patient-days (collected once per wk)
  - Sampled total central line-days (collected once per wk)
- The NHSN application calculates an estimate of central line-days from this data
- Only ICU and ward location types with an average of 75 or more central line-days per month are eligible to use this method
NHSN Data Challenges

- Consistent application of NHSN definitions was been found to be lower than expected in several studies (Niedner, 2010; Lin, et al, 2010; Tomlinson, et al, 2011)
- Collecting CL–days (one per patient) can undercount actual line–days in patients with multiple CVCs
  - Inflates the CLABSI rate in settings with high CVC use
- Vulnerabilities exist in all data collection and reporting programs—and system complexity typically increases when such loopholes are exploited
  - CDC and CMS issued a joint reminder about NHSN Reporting in response to anecdotal reports of intentional non-reporting of infection data (http://www.cdc.gov/nhsn/cms/cms-reporting.html)
NHSN CLABSI Data Vulnerabilities

- Patients subjected to unnecessary tests
- Occasional positive results used to assert “present on admission” (not counted as CLABSI)
- Can result in treatment for bacterial colonization vs. an actual infection

- Attempt to avoid a positive “reportable” result
- Lost opportunity to modify antibiotic choice based on susceptibility results

Patient Risk

Ordering diagnostic tests in absence of clinical symptoms

Discouraging diagnostic tests in presence of symptoms
Applying NHSN Principles to Home Care

• Most home infusion and many home health care organizations lack staff who are specially trained in infection control, surveillance and epidemiology

• Patient self-access removes the central line from CLABSI tracking—in the home, self-care is the goal

• BSI symptoms are documented as part of surveillance, but CLABSI is only recorded when LCBI criterion are met
  – Home care patients with suspected CLABSI may be hospitalized before the LCBI is obtained, verification and results can be difficult to obtain after the patient is off service/hospitalized
Use a Standard Formula for Data Analysis and Reporting

Calculating Rate of CLABSI

Number of BSIs in patients with central lines

\[
\text{Total number of central line days} \times 1000 = \text{CLABSI Rate}
\]

CLABSI Data Challenges in Home Care

• Keeping track of the patient as they move between health care settings
  – “Suspected Infection” can serve as a placeholder for follow-up when patient is admitted before laboratory confirmation is obtained

• Counting catheter days and recording related CLABSI vs. CR-BSI information (e.g., culture results, follow-up care provided, etc.)
  – Software supporting electronic medical records (EMRs) for home-based care providers often lacks the fields specific to CLABSI data collection
  – Manual processes can be time consuming, costly
  – Data validation processes may be non-existent or too simplistic
Collecting and Reporting Patient Outcomes in Home Infusion

- NHIA’s Data Initiative
- Standardized Definitions for Outcomes Data Elements revised in February 2016
- Definitions provide board categories to facilitate eventual comparison across providers
- Industry defined measures are under development

SOURCE: [HTTP://WWW.NHIA.ORG/DATA/DATA-DEFINITIONS.CFM](HTTP://WWW.NHIA.ORG/DATA/DATA-DEFINITIONS.CFM)
### NHIA Outcomes Data

**Element: Access Device Events**

<table>
<thead>
<tr>
<th>DEFINITION</th>
<th>ADDITIONAL INFORMATION / EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Migration/Malposition</td>
<td></td>
</tr>
<tr>
<td>• Dislodgement</td>
<td></td>
</tr>
<tr>
<td>• Access Device Occlusion</td>
<td></td>
</tr>
<tr>
<td>• Phlebitis</td>
<td></td>
</tr>
<tr>
<td>• Skin Integrity Impairment</td>
<td></td>
</tr>
<tr>
<td>• Suspected Access Device Related Bloodstream Infection</td>
<td>An <em>Access Device Related Bloodstream Infection</em> should be suspected when a patient has an access device in place for at least 2 days, and is exhibiting clinical signs of infection.</td>
</tr>
<tr>
<td>• Damage/Breakage</td>
<td></td>
</tr>
<tr>
<td>• Suspected Thrombosis/DVT</td>
<td><em>Skin Integrity Impairment</em> includes exit site infection, or adhesive-related injury.</td>
</tr>
<tr>
<td>• Other: _________________</td>
<td>For <em>Access Device Related Bloodstream Infection</em> and <em>Thrombosis/DVT</em> events, the category is listed as “Suspected” at the initial documentation step. A secondary data element exists to capture these events that are confirmed.</td>
</tr>
<tr>
<td>DISCLAIMER*</td>
<td>ADD. INFORMATION / EXAMPLES</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>• Central Venous Catheter (CVC), tunneled, cuffed</td>
<td></td>
</tr>
<tr>
<td>• Central Venous Catheter (CVC), non-tunneled</td>
<td></td>
</tr>
<tr>
<td>• Implanted Port</td>
<td></td>
</tr>
<tr>
<td>• Intrathecal</td>
<td></td>
</tr>
<tr>
<td>• Epidural</td>
<td></td>
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<tr>
<td>• Peripheral (PIV)</td>
<td></td>
</tr>
<tr>
<td>• Peripherally Inserted Central Catheter (PICC)</td>
<td></td>
</tr>
<tr>
<td>• Midline</td>
<td></td>
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<tr>
<td>• Hemodialysis</td>
<td></td>
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<tr>
<td>• Apheresis</td>
<td></td>
</tr>
<tr>
<td>• Subcutaneous</td>
<td></td>
</tr>
<tr>
<td>• Other: __________________</td>
<td>*Refer to the Infusion Nurses Society (INS) standards for standardized access device definitions.</td>
</tr>
</tbody>
</table>

Examples of CVC, tunneled, cuffed access devices:
• Hickman®
• Broviac®
• Groshong®

Examples of CVC, non-tunneled access devices:
• Any short-term device inserted into the subclavian or internal jugular veins
### NHIA Outcomes Data Element: Access Device Interventions

<table>
<thead>
<tr>
<th>DEFINITION</th>
<th>ADD. INFORMATION / EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provided additional teaching/education</td>
<td>• Other adjunctive treatments exclude interventions separately listed, such as de-clotting procedure performed.</td>
</tr>
<tr>
<td>• Access device repaired/repositioned</td>
<td></td>
</tr>
<tr>
<td>• Access device removed</td>
<td>• Other adjunctive treatments may include interventions to maintain and restore access device patency, such as instilling antibiotic or alcohol lock solutions.</td>
</tr>
<tr>
<td>• Systemic anti-infectives administered</td>
<td></td>
</tr>
<tr>
<td>• De-clotting procedure performed</td>
<td></td>
</tr>
<tr>
<td>• Other adjunctive treatment</td>
<td></td>
</tr>
<tr>
<td>• Discontinued home infusion therapy</td>
<td></td>
</tr>
<tr>
<td>• Unscheduled nursing visit performed</td>
<td></td>
</tr>
<tr>
<td>• Unplanned hospitalization</td>
<td></td>
</tr>
<tr>
<td>• Emergency department (ED) use</td>
<td></td>
</tr>
<tr>
<td>• Cultures drawn</td>
<td></td>
</tr>
<tr>
<td>• Additional tests (x-ray, labs)</td>
<td></td>
</tr>
<tr>
<td>• Access device replaced</td>
<td></td>
</tr>
<tr>
<td>• Other: ________________</td>
<td></td>
</tr>
</tbody>
</table>
### NHIA Outcomes Data Element: Access Device Outcomes

<table>
<thead>
<tr>
<th>DEFINITION</th>
<th>ADD. INFORMATION / EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select the outcome that best describes the impact of the access device event on the home infusion episode.</td>
<td>• An interruption in therapy occurs when the scheduled dose of an infusion medication is significantly delayed or missed.</td>
</tr>
<tr>
<td>• Continuation of home infusion services with no interruption.</td>
<td></td>
</tr>
<tr>
<td>• Interruption of services, followed by resumption of care with therapy changes.</td>
<td></td>
</tr>
<tr>
<td>• Interruption of services, followed by resumption of care without therapy changes.</td>
<td></td>
</tr>
<tr>
<td>• Home infusion services discontinued.</td>
<td></td>
</tr>
</tbody>
</table>
DEFINITION

The following additional data is recommended for access device events:

1. Was this an access device with an integral valve?
2. Was heparin used in the flushing protocol? If yes, then:
   a. What volume of heparin flush was used?
   b. What concentration of heparin was used?
3. What is the name of the device manufacturer?
The following additional data is recommended for **Suspected Access Device Bloodstream Infections**:

1. Identify all provider types that accessed the catheter during the 2 days prior to the date of initial sign(s) of infection, including:
   
<table>
<thead>
<tr>
<th>a. Patient/caregiver</th>
<th>e. Outpatient clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. Home infusion company</td>
<td>f. Hospital</td>
</tr>
<tr>
<td>c. Home care agency</td>
<td>g. Other</td>
</tr>
<tr>
<td>d. Physician</td>
<td>h. None</td>
</tr>
</tbody>
</table>

2. Was the suspected access-device related infection laboratory confirmed?
Home Care CLABSI Data Collection

• **Catheter days**—starting and stopping the clock, manual vs. electronic data capture
  - Can your process capture the 2-day window before home infusion began? *(NHSN Transfer Rule)*
  - Applying the “Sampling Method” to home care—study is needed to validate this approach

• **Patient days**—total days patients received care
  - How do you count active patient days for a weekly therapy?

• Diving deeper into the data requires collection of more factors for comparison—age, diagnosis, central line type, who is accessing the line, etc.
  - Catheter care products used (skin antiseptic, dressing, securement device, needleless connector); flush solution and frequency; staff competency results, etc.
Compare Results to Benchmark Data

CLABSI Incidence in the Home

• Difficult to compare individual results to published research findings, due to…
  – Lack of specificity regarding data sources or definitions used
  – Lack of “risk adjustment” to level-set results across a range of organizations

• Published rates may be associated with specific quality improvement research vs. more standardized surveillance definitions

• In the absence of an external surveillance program, providers should strive to continually improve their own results over time, using caution with general external comparisons
External CLABSI Benchmarking: Hospital Compare

- www.medicare.gov/hospitalcompare
- Standardized Infection Ratio (SIR)—a summary statistic used to track HAI prevention progress over time
- CDC adjusts the SIR for risk factors most associated with differences in infection rates, based on the type of infection measured
- For CLABSIs, this adjustment takes into consideration:
  - Type of patient care location (e.g., burn unit)
  - Hospital affiliation with a medical school
  - Bed size of the patient care location
- THE NATIONAL 2014 SIR FOR CLABSI IS CALCULATED FROM ALL REPORTED CLABSI S IN 2014:
  TOTAL NUMBER OF CLABSI REPORTED
  TOTAL NUMBER OF CLABSI PREDICTED

## The 2014 CLABSI National SIR

2014 national SIR for CLABSI was **0.5**, and the national baseline was **1.0**

<table>
<thead>
<tr>
<th>SIR &gt; 1</th>
<th>SIR = 1</th>
<th>SIR &lt; 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>- There was an increase in # CLABSI reported compared to the baseline</td>
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<tr>
<td>- A high SIR indicates need for stronger HAI prevention efforts</td>
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<tr>
<td>- Other factors: intense data validation activities leading to ↑ discovery and reporting of CLABSI</td>
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<tr>
<td>- There were about the same # of CLABSI reported compared to the baseline</td>
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<tr>
<td>- There was a decrease in # CLABSI reported compared to the baseline</td>
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<tr>
<td>- Usually low SIR = robust CLABSI prevention strategies</td>
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<tr>
<td>- Other factors: under-reporting of data</td>
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<tr>
<td>- Signifies improvement, but still work to be done</td>
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</tbody>
</table>

**Translation:** there was a **50% decrease in CLABSI** between 2008 and 2014

Review Each Case for Root Cause

CLABSI Event in the Home

- Fishbone diagrams are one example of a tool for exploring potential cause and effect as each CLABSI event is analyzed.
- Is this a one-time event, or a trend? Who has the 30,000 foot view needed to see a connection between events?

Regularly Report Results

To Clinicians and Leaders

- Translating findings into performance improvement
  - Moving from root cause analysis to corrective action plan—what changes (if any) are needed to the way care is provided?
  - Staff education and competency validation—not a “one size fits all” scenario
  - Follow-up with results in the next QI cycle—has the problem improved or resolved, or is more work needed?

And as Mandated

- Quality Improvement required for accreditation
- Preparing for eventual public reporting of home care CLABSI rates
QUESTIONS?

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Resources & References


