I. Statement of the Problem

CLABSI is an important and often preventable healthcare-associated infection. Focused interventions in intensive care unit (ICU) settings have reduced the CLABSI disease burden, but a significant, preventable disease burden remains, and a public health roadmap is needed to continue to identify preventable CLABSI within and beyond ICU settings, to characterize prevention opportunities, and to focus prevention efforts. A public health strategy should consider types of facilities and facility locations to be addressed by CLABSI surveillance and prevention efforts over time and as resources permit, and a timeline for implementation.

Use of National Healthcare Safety Network (NHSN) data by the Centers for Medicare and Medicaid Services (CMS) for the purpose of evaluating and incentivizing facility performance through payment\(^1\) has greatly expanded participation in NHSN, and creates an imperative for assuring comparable surveillance methods and data quality among facilities. Most, but not all states use NHSN to meet state legislative obligations to track CLABSI. Despite nationwide participation in NHSN, some state and territorial health departments without reporting laws or rules have limited or no access to information about CLABSI in their jurisdiction, limiting their ability to assure data quality or target prevention resources. To address CSTE Position Statements 10-ID-282, 10-SI-053, and 11-SI-034, which call for CDC to work with CSTE, state, local, tribal, and territorial health officials to standardize surveillance methods, and to minimize duplicative reporting for facilities, NHSN should be designated as a national standard for states and their facilities conducting CLABSI surveillance. Creating a national standard for CLABSI reporting will improve uniformity of reporting among facilities, states, and territories, provide opportunities for data quality assessment and improvement, and enhance the utility of CLABSI prevention efforts.

II. Background and Justification

CLABSI is an important and deadly HAI, with reported mortality of 12% to 25%\(^5\). Many CLABSI are thought to be preventable through meticulous central line insertion practices, line maintenance practices, and timely removal of central lines. Significant progress has been demonstrated in reducing CLABSI attributable to ICUs during the past decade; in 2009 an estimated 18,000 CLABSI occurred in hospitalized patients in ICUs, a 58% reduction from the 43,000 cases estimated in 2001. CLABSI continue to occur in large numbers among hospitalized inpatients not in ICUs (~23,000 annually) and among outpatient hemodialysis patients (~37,000 annually)\(^6\).

According to the 2009 SIR report, eleven states had conducted validation work regarding CLABSI data, including six states that conducted external audits of medical records to assure completeness of CLABSI reporting\(^7\,8\). These efforts represent an important step toward understanding facility-level CLABSI data.

Resulting from state initiatives, legislative mandates, and payment for reporting (Centers for Medicare and Medicaid (CMS) Prospective Payment System (PPS))\(^1\), over 8,000 healthcare facilities have enrolled in NHSN as of 2012, and many will be reporting CLABSI in ICU settings to NHSN. A few states now require reporting of CLABSI in non-ICU locations. NHSN provides uniform surveillance definitions and methodology for CLABSI reporting, and can serve as a national standard for implementing public health surveillance of CLABSI. These data will be available at a Federal level, and can be made available to States, local and territorial jurisdictions with reporting laws or regulations requiring facilities to join the jurisdictional NHSN group, or through a data use agreement with CDC. Use of the NHSN group function...
enables full functionality of NHSN tools and analysis. These data can then be validated and used for prevention activities and quality improvement (e.g., infection prevention collaboratives).

CLABSI surveillance using NHSN methods meets the following criteria for standard reporting under nationwide public health surveillance:

- As of March 2012, a majority (29) of state and territorial jurisdictions (comprising over 60% of the U.S. population) have laws or regulations requiring standard reporting of CLABSI to public health agencies using NHSN surveillance infrastructure. In addition, because of CMS requirements, over 4000 acute care facilities are enrolled in NHSN. Because of expanding CMS requirements, this number is expected to increase over time.
- CDC requests standard reporting of CLABSI to federal agencies through NHSN, whereby State and regional public health jurisdictions may gain access to data for surveillance and/or prevention purposes.
- CDC has condition-specific policies and practices concerning the agency’s response to, and use of, reports to NHSN.

III. Statement of the desired action(s) to be taken

1. CSTE recommends use of National Healthcare Safety Network (NHSN) surveillance definitions, case identification, case classification, and denominator collection methods for CLABSI and recommends that any State, Local or Territorial jurisdiction conducting surveillance for this condition use these standard methods. This entails sharing of case information with CDC through NHSN, using established procedures for such reporting.

2. CSTE recommends that this condition be placed under nationwide surveillance using the methods described above under circumstances defined in Section VII. Jurisdictions may elect to go beyond these circumstances, such as including critical access hospitals.

3. CSTE recommends that CDC publish aggregate data on CLABSI as appropriate in MMWR and/or other venues.

4. CSTE recognizes CLABSI as important to public health, anticipates a need to periodically review and revise surveillance and prevention plans as resources and priorities permit. The current vision and proposed strategies to reduce disease burden are discussed in Section VIII.

IV. Goals of Surveillance

To provide location- and facility-specific, risk adjusted information to facilities for internal quality improvement; to provide location-, facility-, and jurisdiction-specific, risk adjusted information and analytic tools imbedded in NHSN to public health jurisdictions for transparent situational awareness and public health planning and prevention activities, for exploration of data quality, and (in some cases) for public reporting as required by law; to provide location-, facility-, jurisdiction-specific, and national risk adjusted information to Federal agencies on the temporal, geographic, demographic, device-, and pathogen-specific occurrence of CLABSIs to facilitate CLABSI prevention and control.
V. Methods for Surveillance:
NHSN methods and definitions for CLABSI surveillance are located at:
No modifications are recommended.

VI. Case-and denominator definitions, or risk-adjustment for CLABSI
NHSN methods and definitions for CLABSI are located at:
No modifications are recommended.

VII. Proposed Circumstances for Nationwide Surveillance and Reporting of CLABSI
A. Narrative and justification:
As of year 2012, more than two-thirds of acute care hospitals nationwide are reporting CLABSI s from ICUs to NHSN as a result of state mandates or CMS payment incentives. For 2012, CSTE proposes to endorse the CMS requirements nationwide, although recognized gaps and preventable disease burden remain, particularly in non-ICU locations. The location types in this position statement are defined in NHSN. Expansion of recommended CLABSI surveillance to free-standing pediatric and cancer hospitals not currently reporting under CMS requirements, and to locations beyond ICUs, such as ward and ward-like locations is also proposed over time, given that ward settings currently contribute a higher disease burden than ICUs. Infection preventionists routinely investigate positive blood cultures from all locations because of their potential severity, and to evaluate their preventability. These recommendations for expanded reporting are made with the understanding that hospitals will need to identify ways to accurately track denominator data for CLABSI reporting in new locations, even as they continue the necessary work of reviewing positive blood cultures for preventability. The proposed approach to expansion (Table VII-B) allows hospitals to plan for training and graduated implementation of CLABSI surveillance to include denominators, and to explore ways to implement and validate automated denominator surveillance methods to ease reporting burden; however, facilities and/or states that wish to accelerate the pace of expanded CLABSI surveillance further should not feel constrained by this incremental approach.

- As of year 2012, CLABSI surveillance through NHSN should be conducted in all acute care hospitals as consistent with CMS PPS reporting rules in adult, pediatric, and neonatal ICUs (level II/III and III), and in long term acute care hospitals (referred to as long term care hospitals by CMS), as consistent with CMS PPS reporting rules.

Recent studies have demonstrated reductions in CLABSI rates from PICU and NICU locations associated with use of insertion and maintenance bundles and other quality improvement measures. However, higher CLABSI rates continue to be reported to NHSN from pediatric locations, including ICUs, pediatric wards and specialty care area wards, suggesting that preventable disease may remain. Expanded reporting from pediatric locations will provide additional information about preventability, and more robust benchmarks for comparison.

- By or before year 2013, CLABSI surveillance through NHSN should be expanded to include ICU locations in all acute care pediatric hospitals, including those free-standing children’s hospitals falling outside the PPS payment for reporting scheme.

Because the CLABSI case-definition is being refined for some cancer patients, and because modified cancer location mapping options are being introduced in NHSN, all of which are anticipated to be adopted by 2014, recommended CLABSI reporting for patients in cancer hospital ICUs will be recommended to begin by 2014. In addition, because a significant CLABSI disease burden remains outside intensive care units, state, local and territorial jurisdictions are encouraged to expand reporting to other inpatient locations as soon as feasible.

- By or before year 2014, CLABSI surveillance through NHSN should be expanded to include
  - ICU locations in all acute cancer hospitals.
• All specialty care areas and hematology/oncology locations (adult and pediatric) in other (non-cancer) hospitals
• Pediatric medical/surgical wards
• Adult medical/surgical wards and adult step down units.

• By or before year 2015, CLABSI surveillance through NHSN should be expanded to include
  • All remaining inpatient locations in cancer hospitals
  • Pediatric step down units, medical wards, and surgical wards
  • Adult medical wards and adult surgical wards

• By or before year 2016, CLABSI surveillance through NHSN should be expanded to additional inpatient locations (e.g., orthopedic, neurology), based on facility data and/or risk assessment suggesting potential for preventable disease, with the aim of achieving full surveillance implementation by or before 2017.

• By or before year 2017, CLABSI surveillance through NHSN should be expanded to include all inpatient locations where central lines are used.

B. Tables of circumstances where nationwide surveillance through NHSN of CLABSI should be conducted and reported to public health in all jurisdictions.

Table VII-B. Circumstances where nationwide surveillance through NHSN of CLABSI should be conducted and reported to public health in all jurisdictions

<table>
<thead>
<tr>
<th>Facility and Location Type</th>
<th>Begin CLABSI Reporting By or Before</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012</td>
</tr>
<tr>
<td>Acute Care and Long Term Acute Care, excluding Critical Access Hospitals</td>
<td></td>
</tr>
<tr>
<td>All ICUs</td>
<td>x</td>
</tr>
<tr>
<td>All specialty care areas, hematology/oncology</td>
<td></td>
</tr>
<tr>
<td>Pediatric wards (medical/surgical)</td>
<td></td>
</tr>
<tr>
<td>Adult wards (step down units and medical/surgical)</td>
<td></td>
</tr>
<tr>
<td>Pediatric wards (step down units, medical, and surgical wards)</td>
<td></td>
</tr>
<tr>
<td>Adult wards (medical, surgical)</td>
<td></td>
</tr>
<tr>
<td>Expanded inpatient locations, (e.g., orthopedic, neurology) based on facility risk assessment x</td>
<td></td>
</tr>
<tr>
<td>All inpatient locations where central lines are used</td>
<td></td>
</tr>
<tr>
<td>Pediatric Hospitals</td>
<td></td>
</tr>
<tr>
<td>All ICUs</td>
<td>x</td>
</tr>
<tr>
<td>All specialty care areas</td>
<td></td>
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<tr>
<td>Pediatric wards (medical/surgical)</td>
<td></td>
</tr>
<tr>
<td>Pediatric wards (step down units, medical, and surgical wards)</td>
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<tr>
<td>Expanded inpatient locations (e.g., orthopedic, neurology) based on facility risk assessment</td>
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<tr>
<td>All inpatient locations where central lines are used</td>
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<tr>
<td>Cancer Hospitals</td>
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<tr>
<td>All ICUs</td>
<td>x</td>
</tr>
<tr>
<td>All remaining inpatient locations where central lines are used</td>
<td></td>
</tr>
</tbody>
</table>
VIII. Narrative: Public Health Surveillance Vision, Proposed Priorities, and Strategy for Future Expansion or Decrease in Surveillance for CLABSI

CLABSI surveillance is expected to remain a public health priority over the long-term. Data that become available with expanded surveillance will produce better benchmarks for reporting. There is potential that the burden of data collection will be reduced as disease burden and investigations are reduced, reliable methods are implemented using automated sources of denominator information, and as methods for electronic medical records-based surveillance become available. Several peer-review studies document the need for data validation to assure complete and high-quality reporting of CLABSI. CLABSI validation resources should be identified and implemented to assure consistent standards under CMS payment incentives.

IX. Data sharing/release and print criteria

NHSN maintains confidentiality of individuals and reporting facilities. Facilities reporting to NHSN are required to sign data-use agreements that allow CDC to share aggregate de-identified data with CMS. CDC has developed templates for annual nationwide and state-specific Standardized Infection Ratio reports, subject to censure if data are inadequate. These reports are shared with states prior to publication.

Additional recommendations:

- Consumers of health information have different needs and healthcare literacy levels. Reporting of complex data such as CLABSI data requires thoughtful consideration about the intended audience(s) and ways to make the data accessible, understandable, relevant and actionable to the audience. Many states have examined and found useful presentation options for non-technical audiences.
- NHSN maintains confidentiality of individuals and reporting facilities. Reporting by facilities to NHSN requires a data use agreement between facilities and CDC. Fully de-identified NHSN data are aggregated, analyzed and reported annually by the CDC, establishing referent rates for CLABSI and other healthcare-associated infections, by facility types and healthcare service locations. This annual report (a technical report) is published on the CDC’s NHSN website.
- CDC plans to regularly publish annual state-specific healthcare-associated infections summary reports. For these technical reports, nationwide data reported to NHSN are used to estimate the predicted number of HAIs, stratified by type of facility and healthcare service location. The current number of observed cases for each state and the ratio of observed to predicted cases (Standardized Infection Ratio, SIR) is reported, with confidence intervals and key percentile distribution. For this publication, a facility-specific SIR is not calculated if the predicted number of events for a given facility is <1. State SIRs are not calculated unless a minimum of 5 facility-level SIRs are available. Key percentile distributions for a state are not calculated unless a minimum of 20 facility-level SIRs are available. Use of the SIR in HAI surveillance has its proponents and detractors, but an increasing number of states have joined CDC in reporting HAI data using the SIR as the summary metric.
- The Centers for Medicare and Medicaid Services (CMS) publish facility-level NHSN CLABSI SIRs on their Hospital Compare Website, for all qualifying facilities nationwide that participate in the CMS Prospective Payment System (PPS), beginning in 2011. This is done by CMS with the agreement of participating hospitals.
- State-specific plans for data sharing, release, and print criteria vary. Many states publish facility-level CLABSI rates and/or SIRs, either under a state mandate or by a signed agreement with facilities that report voluntarily to the state. Unadjusted CLABSI rates may be useful to individual facilities to track progress over time, but should not be used to compare facilities or states to one another because of different baseline population risks. CSTE recommends that states avoid publishing unadjusted
CLABSI rates, but instead report risk-adjusted data using stratification by location or measures analogous to the SIR. Doing so may result in greater consistency in reported data from CDC, CMS, and states. Methods for calculating the SIR are detailed in the First State-Specific Healthcare-Associated Infections Summary Data Report, available at http://www.cdc.gov/hai/pdfs/stateplans/SIR_05_25_2010.pdf.

- Additional publications using aggregated data are likely, and may include progress reports on HAI elimination and manuscripts in peer-reviewed journals.

X. References


XI. Coordination

Agencies for Response

(1) Centers for Disease Control and Prevention
Thomas Frieden MD, MPH
Director
1600 Clifton Road, NE
Atlanta, GA 30333
404-639-7000
Txf2@cdc.gov

(2) Centers for Medicare and Medicaid Services
Michael T. Rapp, M.D., J.D.
Director, Quality Measurement and Assessment Group
Office of Clinical Standards and Quality
Center for Medicare and Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244-1850
Phone 410.786.9313
michael.rapp@cms.hhs.gov

Agencies for Information:

(1) Department of Health and Human Services
Donald Wright, MD, MPH
Principal Deputy Assistant Secretary for Health
200 Independence Avenue SW
Room 716-G
Washington, DC
(202) 690-7694
don.wright@hhs.gov

(2) Association of State and Territorial Health Officials
Paul Jarris, MD
Executive Director
2231 Crystal Drive,
Suite 450
Arlington, VA 22202
XI. Submitting Author:

(1) Marion Kainer, MD, MPH
Director, Healthcare Associated Infections and Antimicrobial Resistance Program
Tennessee Dept. of Health
425 5th Avenue N
Nashville, TN 37224
(615) 741-7247
Marion.Kainer@tn.gov

Co-Author:

(1) Kathryn E. Arnold, MD
Medical Officer
Centers for Disease Control and Prevention
Division of Healthcare Quality Promotion, Surveillance Branch
1600 Clifton Road NE, MS A-24
Atlanta, GA 30333
(404) 639-4131
kea3@cdc.gov