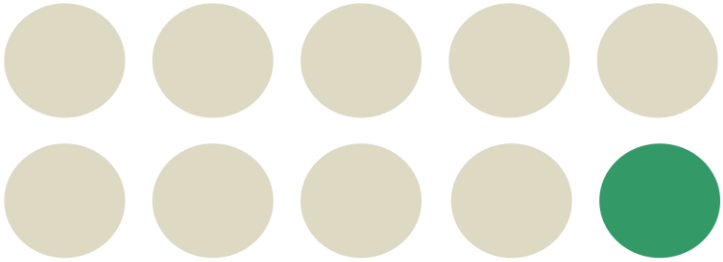

Maryland Central Line-Associated Blood Stream Infections: Data Quality Review and Chart Audit

June 2010

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Acknowledgements

This report represents the culmination of the work and expertise of many individuals. The Maryland Health Care Commission's (MHCC) Healthcare-Associated Infections Advisory Committee provided invaluable guidance and direction throughout the planning and development phase of this project. APIC Consulting Services, Inc. (ACSI) provided a team of experienced Infection Preventionists (IPs), led by Mary Andrus, BA, RN, CIC, a noted expert in National Healthcare Safety Network (NHSN) reporting. Each ACSI team member brought over 20 years of experience in infection prevention to the on-site hospital chart review portion of this project and each holds a Certification in Infection Control (CIC). Their knowledge and professionalism in the field contributed significantly to the success of this project. We are grateful to Mary Andrus, who led all aspects of the project including work plan development, validation methodology, auditor training, data analysis, and report writing. Ms. Andrus' in-depth knowledge and experience with NHSN were critical to this project. We also want to thank Patty Leeman, of ACSI, for overall project management and coordination. Finally, we appreciate the efforts of Maryland hospital IPs in data collection and facilitating the audit project.

This project would not have been possible without the significant contribution of Commission staff member, Eileen Witherspoon, a Health Policy Analyst in the Center for Hospital Services. Ms. Witherspoon interfaced with hospitals on a daily basis to facilitate timely submission of the clinical data required for the target sample selection process, coordinate auditor assignments, and ensure prompt resolution of hospital and auditor issues. A special thanks to Commission staff member, Leslie LaBrecque, Chief of Data Base and Applications Development in the Center for Information Services and Analysis, who developed a secure, password protected web portal on the MHCC server to accommodate the submission of the clinical laboratory data required to complete this project.

Glossary of Terms

Central Line-associated Bloodstream Infection (Source: NHSN Patient Safety Component Users Manual)

Bloodstream Infection (BSI) - At the time of the study, two specific surveillance criteria were used for identification of BSI:

- ***Laboratory-confirmed bloodstream infection (LCBI)*** may be used for patients of any age and must meet at least 1 of the following criteria:

  -Patient has a recognized pathogen cultured from 1 or more blood cultures and organism cultured from blood is *not* related to an infection at another site.

  -Patient has at least 1 of the following signs or symptoms: fever (>38°C), chills, or hypotension and signs and symptoms and positive laboratory results are not related to an infection at another site and common skin contaminant (i.e., diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp) is cultured from 2 or more blood cultures drawn on separate occasions.

  -Patient ≤1 year of age has at least 1 of the following signs or symptoms: fever (>38°C), hypothermia (<37°C), apnea or bradycardia and signs and symptoms and positive laboratory results are not related to an infection at another site and common skin contaminant (i.e., diphtheroids [*Corynebacterium* spp], *Bacillus* [not *B anthracis*] spp, *Propionibacterium* spp, coagulase-negative staphylococci [including *S epidermidis*], viridans group streptococci, *Aerococcus* spp, *Micrococcus* spp) is cultured from 2 or more blood cultures drawn on separate occasions.

- ***Clinical Sepsis (CSEP)*** may be used only to report primary BSI in neonates and infants It is not used to report BSI in adults and children. CSEP must meet the following criterion:

  - Patient ≤1 year of age has at least 1 of the following signs or symptoms with no other recognized cause: fever (>38°C), hypothermia (<37°C), apnea or bradycardia and blood culture not done or no organisms detected in blood and no apparent infection at another site and physician institutes treatment for sepsis.

Central Line is an intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring. The following are considered great vessels for the purpose of reporting central line-associated days in the NHSN system: aorta; pulmonary artery; superior vena cava; inferior vena cava; brachiocephalic veins; internal jugular veins; subclavian veins; external iliac veins; and, common femoral veins.

Central Line-associated Bloodstream Infection (CLABSI) is a primary bloodstream infection (BSI) in a patient that had a central line within the 48-hour period before the development of the BSI and that is not related to an infection at another site.

Central Line Days is a daily count of the number of patients with a central line in the patient care location during a time period. To calculate central line days, for each day of the month, at the same time each day, record the number of patients who have one or more central line. At the end of the month sum the daily counts.

Patient Days is a daily count of the number of patients in the patient care location during a time period. To calculate patient days, for each day of the month, at the same time each day, record the number of patients. At the end of the month, sum the daily counts.

Date of CLABSI is the date when the first signs or symptoms of the BSI appeared, or the date the specimen used to meet the infection criterion was collected, whichever came first.

Audit Definitions

Detected Infections are those that were identified by the MHCC auditors through retrospective chart review.

Discrepant Infections are infections that either were reported or detected, but not both; that is the reported infection was not detected through retrospective chart review by the data collectors, or the data collectors detected an infection that had not been identified prospectively and reported by the hospital.

Matching Infections are hospital reported infections that also were detected during the MHCC audit.

Reported CLABSIs are those that were identified by hospital staff through routine prospective surveillance and were reported by the ***participating*** hospitals to NHSN.

Undetermined Cases are audited cases that did not document enough information to decisively determine whether a CLABSI existed. This includes cases where the audit decision was contested by the hospital. All undetermined cases were reviewed by the Project Director.

Analysis Terms

Negative Predictive Value (NPV) refers to the proportion of patients with negative test results who are correctly not reported.

Positive Predictive Value (PPV) refers to the proportion of patients with positive test results who are correctly reported.

Sensitivity measures the proportion of actual positives which are correctly identified.

Specificity measures the proportion of negatives which are correctly identified.

Introduction

Background

The importance of reducing preventable healthcare-associated infections (HAIs) has been recognized as a priority by Maryland legislators, hospitals, health care providers, and state health policy professionals. Under legislation adopted in the 2006 General Assembly session, Maryland has undertaken a number of activities designed to collect and report data on HAIs. To assist in developing a plan for HAI data collection and reporting, the Commission appointed an HAI Technical Advisory Committee (TAC). The purpose of the TAC was to study and develop recommendations on the design and content of a system for collecting and publicly reporting HAI data. The Committee reviewed guidelines from the federal Centers for Disease Control and Prevention (CDC) and professional associations, evidence from the medical literature regarding appropriate measures for analyzing and reporting data on healthcare-associated infections, and the work of other states in implementing legislative mandates to collect and publicly report data on infections. The TAC's report, *Developing a System for Collecting and Publicly Reporting Data on Healthcare-Associated Infections in Maryland,*[1] contained a series of recommendations covering three areas: HAI process and outcome measures for public reporting; data collection and reporting system; and, implementing public reporting of HAI data.

The TAC recommended that all Maryland acute general hospitals enroll in the CDC's National Healthcare Safety Network (NHSN) system and use the NHSN system to report central line-associated blood stream infection (CLABSI) data to the Commission from all intensive care units. Beginning July 1, 2008, the Commission required all Maryland hospitals to initiate CLABSI data collection. This reporting requirement applied to infections occurring after July 1, 2008 in any intensive care unit (i.e., all units defined as inpatient adult critical care and pediatric critical care; and, units defined as neonatal critical care- according to the *NHSN Manual: Patient Safety Component Protocol, updated January 2008)* regardless of when the patient was admitted. Under this reporting requirement, 46 acute general hospitals began collecting and reporting data to the Commission.[2]

To ensure that hospitals are accurately reporting HAI process and outcome measures and using the same definitions, the TAC recommended that the Commission develop a method for validating and auditing data to be publicly reported. To implement this recommendation, the

[1] Available at:
http://mhcc.maryland.gov/healthcare_associated_infections/hai_report_jan2008/hai_cover.html

[2] In July 2008, 46 of the 47 non-federal, acute general hospitals in Maryland maintained critical care units covered by this reporting requirement. Edward W. McCready Memorial Hospital (Somerset County), an acute care hospital licensed for 8-beds, does not operate a critical care unit and was exempted from this reporting requirement. In November 2009, the new Western Maryland Regional Medical Center in Cumberland (Allegany County) replaced Braddock Hospital (formerly Sacred Heart Hospital) and Memorial Hospital of Cumberland. With the opening of the Western Maryland Regional Medical Center, the CLABSI reporting requirement covers 45 of the 46 non-federal, acute care hospitals in Maryland.

Commission released a Request for Proposals[3] in June 2009 seeking consultant services to develop and implement a plan for validating NHSN CLABSI data collected from Maryland hospitals for the period July 1, 2008-June 30, 2009. The major activities of this project included: (1) development of a plan to validate numerator and denominator data for CLABSI outcome measures; (2) conduct of 200 on-site hospital record reviews; and, (3) preparation and summary of audit findings.

The contract was awarded to APIC Consulting Services, Inc. (ACSI) in September 2009. This report, *Central Line-Associated Blood Stream Infections: Data Quality Review and Chart Audit*, summarizes the results of the audit of Maryland hospital CLABSI data for the period July 1, 2008-June 30, 2009.

Audit Objectives

- To assess the accuracy and completeness of selected CLABSIs reported to the NHSN on patients in critical care hospital locations (e.g., adult and pediatric intensive care units and neonatal care units) during the time period between July 1, 2008 and June 30, 2009;
- To determine whether selected cases reported to MHCC meet NHSN criteria; and,
- To evaluate current surveillance methods used to detect infections and associated denominators.

Healthcare-Associated Infections Advisory Committee

The Commission took steps to establish a standing Healthcare-Associated Infections (HAI) Advisory Committee in early 2008 by inviting key stakeholder organizations to nominate representatives. The stakeholder organizations contacted included: the Washington, D.C. and Metropolitan Baltimore Chapters of the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC); CareFirst Blue Cross and Blue Shield; Maryland Department of Health and Mental Hygiene; Health Facilities Association of Maryland; LifeSpan; Maryland Ambulatory Surgery Association; Maryland Hospital Association; Maryland Patient Safety Center; and, the Society for Healthcare Epidemiology of America (SHEA). The Advisory Committee began meeting in the spring of 2008 and has since met on a monthly basis to develop and implement plans for collecting and reporting HAI data.

Consistent with expanding the role of the HAI Advisory Committee to include development of the Maryland HAI Prevention Plan, the Commission has taken steps to expand the Committee membership. In December 2009, the Advisory Committee was expanded to include two agencies in the Department of Health and Mental Hygiene: the Office of Health Care Quality; and, the Information Resources Management Administration. The Delmarva Foundation for Medical Care (Delmarva), which is the Medicare Quality Improvement Organization (QIO) for Maryland and the District of Columbia, was also added to the Advisory Committee in

[3]MHCC 10-002, Request for Proposal: Consultant Services to Support Central Line-Associated Blood Stream Infection Data Quality Review and Validation, issued June 3, 2009.

December 2009. In addition, a representative from the Maryland Society of Health-System Pharmacists joined the Committee in February 2010.

The membership of the HAI Advisory Committee is provided in Figure 1.

About the Maryland Health Care Commission

The Maryland Health Care Commission is a 15-member, independent commission, functioning administratively within the Maryland Department of Health and Mental Hygiene. The 15 Commissioners are appointed by the Governor with the advice and consent of the Maryland Senate. The Commission's mission is to plan for health system needs, promote informed decision-making, increase accountability, improve access in a rapidly changing health care environment, and to provide timely and accurate information and policy analysis to policy makers, purchasers, providers, and the public. The Maryland General Assembly created the Commission in 1999 through the consolidation of two existing commissions to "establish a streamlined health care regulatory system within the State of Maryland in a manner such that a single State health policy can be better articulated, coordinated, and implemented in order to better serve the citizens of this State."

The Commission is organized around five major topic areas: Center for Hospital Services; Center for Long-term Care and Community-Based Services; Center for Financing and Health Policy; Center for Information Services and Analysis; and Center for Health Information Technology. The Center for Hospital Services is responsible for: developing the State Health Plan for Health Care Facilities and Services; administering the Certificate of Need program; and, developing and implementing Hospital Quality Initiatives, including the Hospital Performance Evaluation Guide and healthcare-associated infections data reporting and prevention planning.

Figure 1.
Maryland Health Care Commission
Healthcare-Associated Infections (HAI) Advisory Committee

Beverly Collins, M.D., MBA, MS
Medical Director, Healthcare Informatics
CareFirst BlueCross BlueShield

Sara E. Cosgrove, M.D., M.S.
Associate Professor of Medicine
Division of Infectious Diseases
Director, Antibiotic Management Program
Associate Hospital Epidemiologist, Johns Hopkins Medical Institutions

Jacqueline Daley, HBSc, MLT, CIC, CSPDS
Director, Infection Prevention and Control
Sinai Hospital of Baltimore

Maria E. Eckart, RN, BSN, CIC
Regional Education Coordinator, Infection Control Consultant, Towson Regional Office, Genesis Health Care

Elizabeth P. (Libby) Fuss, RN, MS, CIC
Infection Control/Associate Health Manager
Carroll Hospital Center

Wendy L. Gary, MHA, Vice President
Healthcare Quality and Patient Safety
Delmarva Foundation for Medical Care

Andrea Hyatt, President
MD Association of Ambulatory Surgery Centers
c/o Dulaney Eye Institute

Debra Illig, RN, MBA, CLNC
Executive Director, Quality and Patient Safety
Adventist HealthCare, Inc.

Anthony Harris, M.D., M.P.H., Associate Professor Epidemiology and Preventive Medicine, University of Maryland School of Medicine

Lynne V. Karanfil, RN, MA, CIC
Corporate Coordinator, Infection Control
MedStar Health-Performance Improvement

Jean E. Lee, Pharm.D., BCPS, Co-Chair
MSHP Antimicrobial Stewardship Committee
Clinical Pharmacy Specialist in Infectious Diseases
Sinai Hospital of Baltimore

Michael Anne Preas, RN, BSN, CIC
Infection Prevention and Control
University of Maryland Medical Center

Peggy Pass, RN, BSN, MS, CIC
President, APIC Greater Baltimore Chapter
Director, Infection Prevention Control
St. Agnes Hospital

Brenda Roup, Ph.D, RN, CIC
Nurse Consultant in Infection Prevention & Control, Office of Infectious Disease Epidemiology and Outbreak Response, IDEHA
Department of Health and Mental Hygiene

Jack Schwartz, Esq.
Visiting Professor, Health Policy and Law Fellow
University of Maryland School of Law

Patricia Swartz, MPH, MS
PH Informaticist / HAN Coordinator,
Information Resources Management Administration
Department of Health and Mental Hygiene

William Minogue, M.D., Executive Director,
Maryland Patient Safety Center

Carol B. Payne, Consumer Representative
Baltimore Office, HUD

Kerri A. Thom, M.D., MS
Associate Hospital Epidemiologist, University of Maryland Medical Center
Assistant Professor, Department of Epidemiology and Preventive Medicine, University of Maryland

Renee Webster, Assistant Director,
Hospitals, Laboratories, and Patient Safety
Office of Health Care Quality
Department of Health and Mental Hygiene

Lucy E. Wilson, M.D., Sc.M.
Chief, Center for Surveillance, Infection Prevention and Outbreak Response, Office of Infectious Disease Epidemiology and Outbreak Response, IDEHA, Department of Health and Mental Hygiene

February 2010

Central Line-Associated Blood Stream Infection Data Audit Methodology

Roles and Responsibilities: APIC Consulting Services, Inc. and Maryland Health Care Commission

Roles and responsibilities of the APIC Consulting Services, Inc. (ACSI) Project Director and Data Auditors and the Maryland Health Care Commission were defined during the planning phase of the audit project. Each is identified below:

Project Director (ACSI):

- Design the plan for patient record audit and the interview questionnaire which was used to determine the appropriateness of data collection methods used in reporting hospitals.
- Train audit staff.
- Provide technical support during the audit process. The Project Director was not on site during any of the audit process, but was available for questions from the ACSI Auditors during this time period.
- Collect findings and submit Summary of Findings to MHCC which included hospital-specific findings and overall findings. Provide individual analysis of data for incorporation in letters with hospital-specific findings.
- Reconcile discrepancies identified following the audit process by contacting individual hospitals with concerns and addressing each issue identified.
- Submit recommendations to MHCC based on audit results.
- Present audit report and findings to the HAI Advisory Committee.

Data Auditors (ACSI):

- Five Infection Preventionists performed the on-site audit. Each auditor was certified in infection control (CIC) and had experience in HAI surveillance in a hospital setting.
- A one-day training workshop for the Data Auditors was coordinated by ACSI on December 8, 2009 and included the following: basic NHSN details (e.g., locations, monthly reporting plan); CLABSI protocols and definitions; determining primary vs. secondary blood stream infections; chart audit process; and, collection of summary data questionnaire. Extensive work was also done using case studies and interactive training. The training was conducted by the Project Director.
- Auditors were assigned to visit individual hospitals by ACSI.

Maryland Health Care Commission:

- Communication with hospitals regarding the Audit Plan
  - Memorandum to hospital CEOs notifying them of CLABSI Audit. See Appendix I.
  - Scheduling on- site visits (e.g., introduction of ACSI, polling hospitals regarding available dates for the site visit). See Appendix II.
  - Collection of positive blood culture data from each hospital. See Appendix III.
  - Letter to hospital contact regarding audit process and list of records for review. See Appendix IV.
  - Follow-up communication with hospitals regarding audit results. See Appendix V.
- Creation of sampling framework based on the ACSI Audit Plan.

- Positive blood culture list
- ICU ranking list
- Individual ICU CLABSI line list

- Selection of ICU facilities and patient records for review based on Audit Plan.

Creating the Sampling Framework

As noted earlier, the Commission determined that the audit would include a sample of 200 patient records to identify the presence or absence of CLABSI criteria using the NHSN definition and protocol. Based on this guidance, the contractor developed several options for creation of a sampling framework. These options were presented to the HAI Advisory Committee at their October 8, 2009 meeting. The options presented are summarized in Table 1 below.

Table 1
Options for Creating the Audit Sampling Framework

Options	Number of Patient Charts Reviewed	Comments
Option 1. Review of every ICU (87)	2 – 3 per ICU	Review 3 charts in ICUs falling in the top and bottom 22 (25th percentile) of the ranking list and 2 charts in all others.
Option 2. Review every hospital (46)	4 – 5 per facility	Review 5 charts in ICUs falling in the top and bottom 11 (i.e., 25th percentile) of the ranking list and 4 charts in all others. If one location from a facility has been selected, do not include second location from the same facility.
Option 3. Review of 1/3 sample of all ICUs (29). Facilities will be selected if they are in the top or bottom, 14 facilities on the ranking list	7 per ICU selected	Review 7 records in each ICU

Because this was the initial audit of CLABSI data, the HAI Advisory Committee recommended that priority be given to including all hospitals in the audit project. In this manner, the Commission would be able to identify educational opportunities that could improve the quality of data reporting in future years. Based on the Advisory Committee's recommendations, Option 2 was selected. Option 2 involved selecting 4-5 charts in every hospital and reviewing five charts in ICUs falling in the top and bottom 11 (i.e., 25th percentile) of the ranking list and four charts in all other hospitals. While there were 47 acute care hospitals in Maryland, one hospital was excluded because it did not have an intensive care unit and another was excluded because no positive blood cultures were identified during the study period. Consequently, 45 hospitals were included in the final audit plan.

Selection of Intensive Care Units for Review

The following steps were used to generate an **ICU Ranking List**.

Step 1: A list of all reporting ICUs with the name of the facility and ICU, and corresponding CLABSI Rate, was generated. For this purpose only, if the location was a NICU, birth weight and line-type rates were aggregated.

Step 2: A random number was assigned to each hospital, using a Research Randomizer tool (http://www.randomizer.org/form.htm).

Step 3: The list was sorted by random number in ascending order. Once randomized, each hospital was assigned a letter identifier (i.e., A, B, C, etc.)

Step 4: Hospital names and other identifiers were removed and the list was resorted in descending order of CLABSI Rates. The hospital names were removed so that the Project Director was blinded to the hospital CLABSI rate information to prevent bias.

Because 200 patient records were to be reviewed, ICUs for review were selected using the following rule: select first for review ICUs falling in the top and bottom 11 of the ICU Ranking List (Step 4 above). If one location from a facility was previously selected, a second location from the same facility could not be selected.

Selection of Patient Records for Review

The following lists were generated for the purpose of selecting patient records for review:

- **Positive Blood Culture List:** A list of positive blood culture(s) submitted as requested from each reporting ICU drawn between July 1, 2008 and June 30, 2009 for patients in the selected critical care unit. This list was submitted in electronic format to a password protected website portal developed by the Commission and included the following information:

    - Patient medical record number;
    - Date of specimen collection;
    - Time of specimen collection; and,
    - Blood culture results for all pathogens and common skin contaminants (e.g., diphtheroids [*Corynebacterium* spp.], *Bacillus* [not *B. anthracis*] spp., *Propionibacterium* spp., coagulase-negative staphylococci [including *S. epidermidis*], viridans group streptococci, *Aerococcus* spp., *Micrococcus* spp.).

This list was sorted by patient medical record number and then by date of specimen collection in ascending order. The list was de-identified, using the alpha code used for each facility in the ICU Ranking List.

- **CLABSI Line List:** A line list generated for each reporting ICU identified CLABSIs reported to NHSN with event dates between July 1, 2008 and June 30, 2009. Each list included the following information:

- Patient ID # (corresponds to Patient Medical Record)
- Date of CLABSI event

The list was de-identified, using the alpha code used for each facility in the ICU Ranking List.

- **Audit Target List:** MHCC generated an Audit Target List for each ICU. The Audit Target List identified the list of patient records for review. The Audit Target List was generated using the following steps:

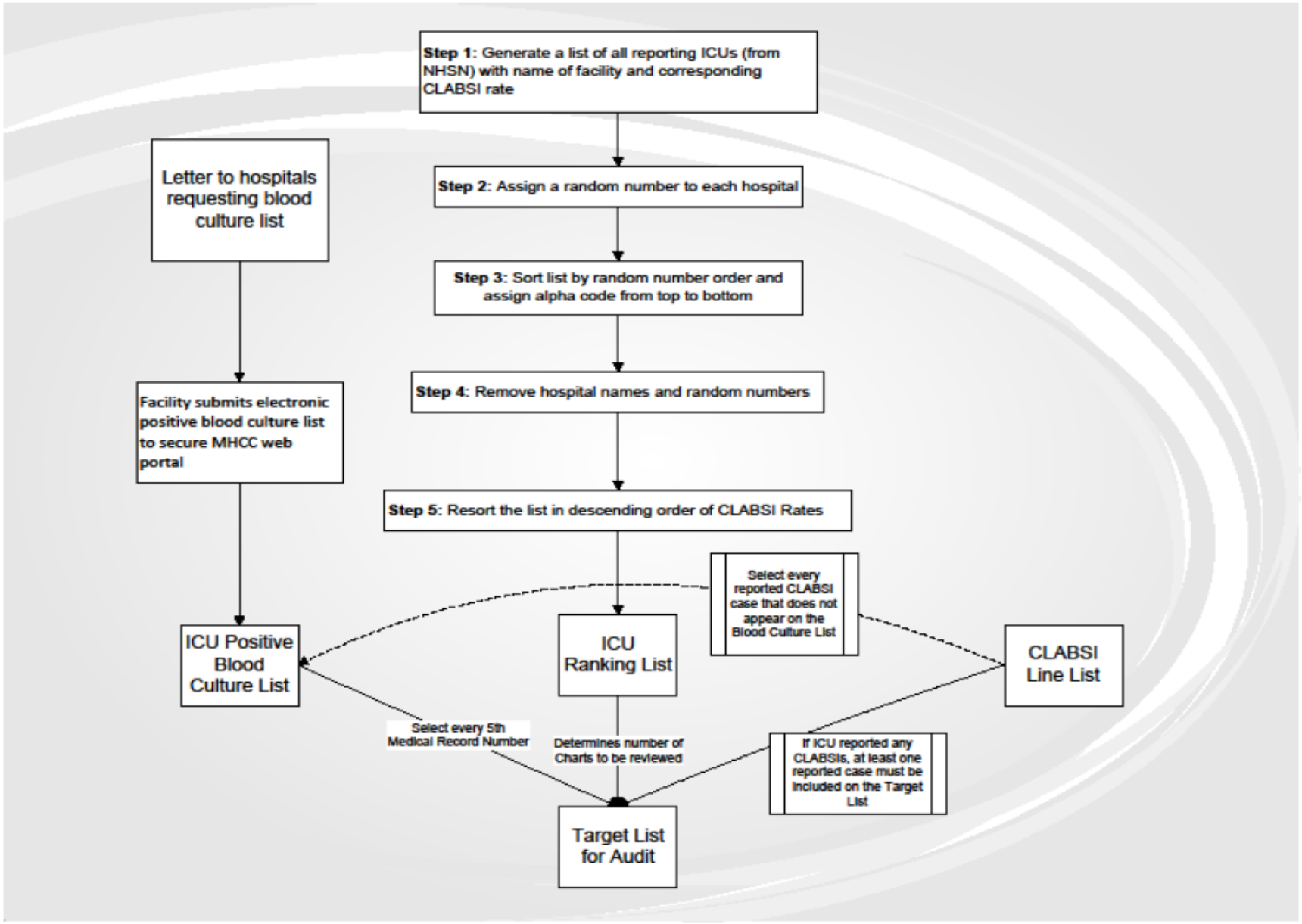
Step 1: Determine target number of charts to review after sorting from most recent to oldest date of the CLABSI event. Eliminate multiple positive cultures for the same patient over the study period by sorting on medical record number. For each ICU selected, based on the criteria for selection of Intensive Care Units (see page 10), the number of patient records to be reviewed was determined. If an ICU was in the top or bottom 11, then 5 records were reviewed. All other ICUs had 4 records reviewed.

Step 2: The CLABSI Line List was reviewed and compared to the ICU's corresponding Positive Blood Culture list. The Patient ID for any patient on the CLABSI Line List that did not appear on the Positive Blood Culture list was placed at the top of the Target List for that ICU.

Step 3: Using the Positive Blood Culture List, every 5^{th} patient was selected for review until the target chart number (Step 2) for that ICU was reached.

Step 4: The Audit Target List was compared to the CLABSI Line List. If none of the Patient Medical Record Numbers from the target list appeared on the CLABSI Line List, the last record on the Audit Target List was crossed off, and the 5^{th} patient that follows that patient on the Positive Blood Culture list was selected. If that patient did not appear on the CLABSI Line List, the 5^{th} patient following that one was used until at least one patient on the Audit Target List included a patient that was reported to NHSN by the ICU, unless there were no CLABSIs reported by the ICU (no Patient Medical Record Numbers on the CLABSI Line List). If there were no CLABSIs reported, the Audit Target List was complete once the target number had been selected from the Positive Blood Culture List.

Figure 2. CLABSI Chart Audit Process Steps



STUDY RESULTS

The audit consisted of two main activities, the actual review of the patient records and an interview of hospital staff involved in the collection of central line data. A total of 45 ICUs at 45 Maryland hospitals were reviewed.

It is important to note that studies to evaluate the effectiveness of surveillance outcomes are technically difficult and imply the presence of a reference standard. In this case, retrospective chart review by trained experts was used as the standard, with review by the Project Director for discrepant cases. While retrospective chart review has been used successfully in other studies (Emori TG, 1988), the data collectors must be well-trained in CDC surveillance definitions, NHSN protocols, evaluation of complex cases and navigation through medical records in both paper and electronic formats.

Review of Patient Records

In the first part of the study, the auditors examined a total of 202 patient records. Four to five records were reviewed at each ICU. Audit results were recorded on the CLABSI Audit form which was sent to the Project Director for review. Each audit form was reviewed for completeness and accuracy. Before the audit results were compiled, a total of 14 audit records required further investigation, either in the form of a telephone conversation with the Infection Preventionist at the audited hospital, or clarification of dates with the staff at MHCC. All 14 cases were resolved. The results of the audit are described in Table 2. Among audited records were 73 CLABSI infections that had been reported to NHSN by Maryland hospitals. The other 129 records reviewed were not reported to NHSN as CLABSIs.

After extensive review of the patients' records, the auditors retrospectively matched 67 (91.7%) of the 73 reported CLABSIs. They also identified eight discrepant CLABSIs in the patient records that had not been reported prospectively. There did not appear to be any trends in unreported CLABSI cases.

The audit determined there were 127 records reviewed in which no CLABSI was present. Auditors retrospectively matched 121 (95.2%) of these cases that were not reported to NHSN by the hospitals. However, they found 6 cases that were reported to NHSN in which the criteria for CLABSI were not met. In three of these cases, the BSI was secondary to another documented infection, in two of these cases, the BSIs were identified using outdated criteria; and, in one case a CLABSI was reported that should not have been attributed to the ICU. Two of the six cases were from one hospital.

In total, the audit determined that 14 of the 202 records reviewed were discrepant from the CLABSIs reported to NHSN or undetermined based on the information available. These 14 patient cases were reviewed by the Project Director.

- In four of these cases, a CLABSI that was reported to NHSN was subsequently identified by the auditor as a blood stream infection BSI that was secondary to

another established infection. Upon review by the Project Director, two of the four BSIs were determined to be correctly reported CLABSIs and two were secondary to another infection and were thus incorrectly reported.

- Two of the cases indicated agreement between the hospital and the auditor, but there was not enough documentation in the audit record to support the decision. The Project Director contacted each hospital and after further review determined that the cases were secondary BSIs and correctly not reported to NHSN.

- One case involved an organism that was identified by the hospital as a common skin contaminant. However, because the organism was not on the list of common skin contaminants allowed by NHSN, and because only one isolate was identified, the organism was determined to be a recognized pathogen for surveillance purposes. The case was determined to be a CLABSI that should have been reported to NHSN. This case was addressed a second time when it was suggested that because the line was a "venous sheath", it did not meet the criteria for a central line. Upon review and discussion, it was determined that the tip of the catheter was located in the femoral vein and therefore, was a central line.

- One CLABSI was identified by the auditor as not meeting the criteria for CLABSI on 1/6/09 but a CLABSI was reported to NHSN by the hospital. Upon further investigation, the CLABSI was not reported on 1/6/09, but was reported on 2/6/09 (based on a separate culture). Since the latter date was not included in the audit, it was agreed that the hospital had acted appropriately by not reporting the case.

- One CLABSI case that was reported by the hospital was determined by the auditor not to meet BSI criteria because the signs/symptoms criteria were not met. The hospital identified hypotension as the sign/symptom with blood pressure readings of 101/56 and 102/46. Since the hypotension criteria are not clearly defined in NHSN, the Project Director agreed with the hospital that LCBI Criterion #2 was met and the CLABSI was reported correctly.

- Four additional cases that were reported were identified by the audit as not meeting CLABSI criteria. All of the cases below were reviewed by the Project Director and determined to have been reported correctly by the hospital.
  - Two audit records identified the patient as not having a central line.
  - One audit record indicated that "MD diagnosis" was the only criteria used.
  - One audit record indicated that the infection was present on admission and that the organism was community-associated.

Table 2. Comparison of Central line-associated Bloodstream Infections (CLABSIs) Identified by Hospital Infection Prevention Staff Reported to NHSN and Maryland Health Care Commission Auditors

Audit Determination	CLABSI Reported to NHSN by ICU	No CLABSI Reported to NHSN by ICU	Total
CLABSI Identified	67 (33.1%)	8 (4.0%)	75 (37.1%)
No CLABSI	6 (3.0%)	121 (59.9%)	127 (64.9%)
Total	**73 (36.1%)**	**129 (63.9%)**	**202 (100%)**

The overall sensitivity was 91.78% and the specificity was 93.8%. Overall positive predictive value (PPV) was 89.33% and negative predictive value (NPV) was 95.28%. "Over-calling" CLABSIs by the facility was a combination of using outdated definitions and reporting BSIs that were secondary to another documented infection. There were no trends identified in "under-calling" CLABSIs.

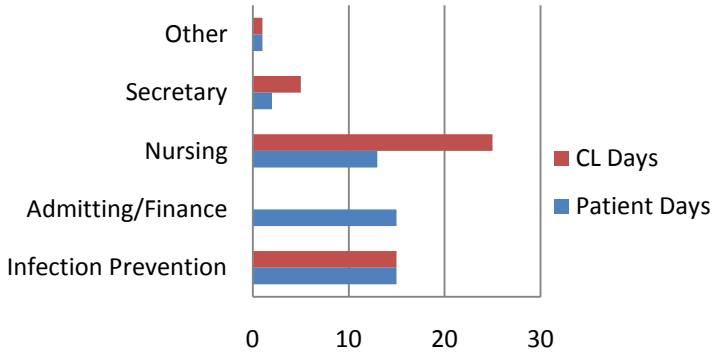
Interview of Hospital Staff

In the second part of the study, representatives from each monitored ICU were interviewed by the auditors using a standard interview questionnaire. The interview instrument (Appendix VI) consisted of 21 questions. The purpose of the interview was to gain a better understanding of hospital procedures associated with the collection of CLABSI data and to assess hospital compliance with NHSN definitions and protocols. Questions about facility size and structure are included in Table 3 below and responses to data collection questions are summarized in Figures 3-13 that follow.

Table 3
Responses to Survey Questions Regarding Facility Size and Structure

Survey Question	Results (all 45 ICUs)	Comments
1. Number of beds in ICU monitored a. As of July 1, 2008 b. As of June 30, 2009	691 672	
2. Were there any changes in the number and/or organization of ICU units during the reporting period?	Six facilities reported that changes had been made	• Merger of two hospitals resulted in merger of ICUs • Merger of two ICUs into one in same hospital (2 responses) • One previous ICU split into two separate ICUs • Number of ICU beds reduced (2 responses)
3. Do you have more than one Medical-Surgical ICU? How do you report these to NHSN?	Six facilities reported more than one MSICU; one of which combined units together for reporting	Each MSICU should be reported to NHSN separately.

Figure 3. Personnel Collecting Data



NHSN Patient Days is the number of patients on the unit counted every day at the same time. The total is entered into NHSN at the end of the month.
NHSN Central Line Days is the number of patients with one or more central line(s) counted every day at the same time. The total is entered into NHSN at the end of the month.

Figure 4. Mechanism Used to Collect CL and Patient Days

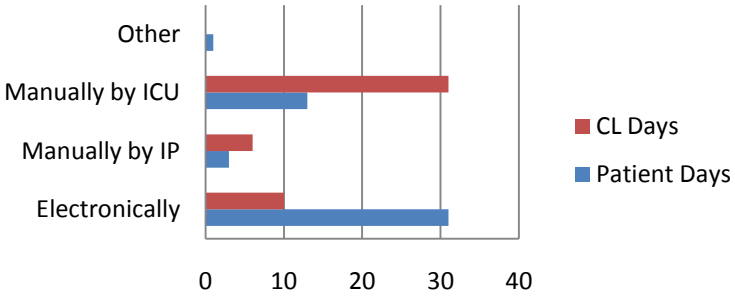
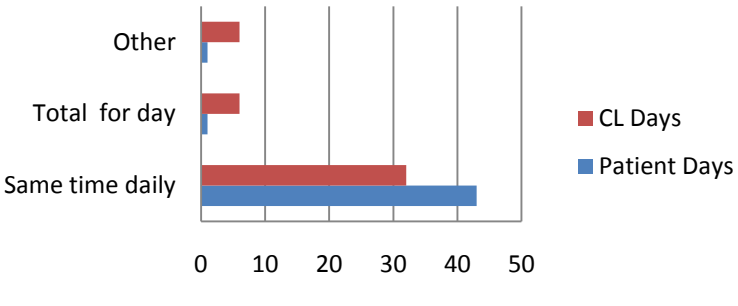
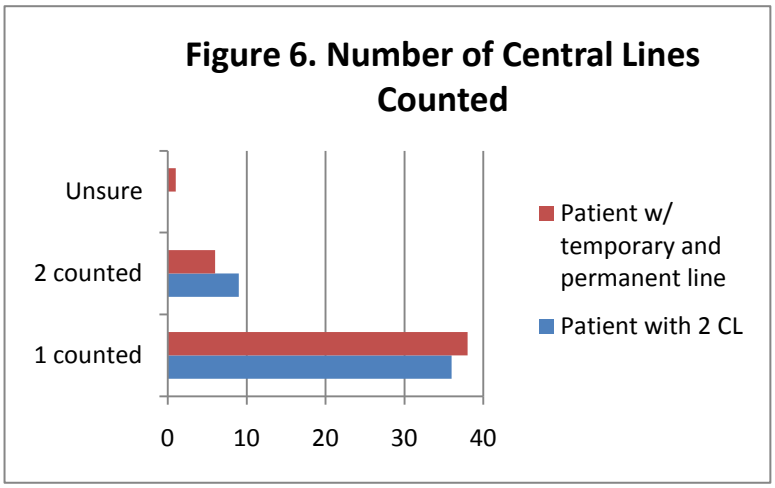


Figure 5. Methodology Used for Counting CL and Patient Days

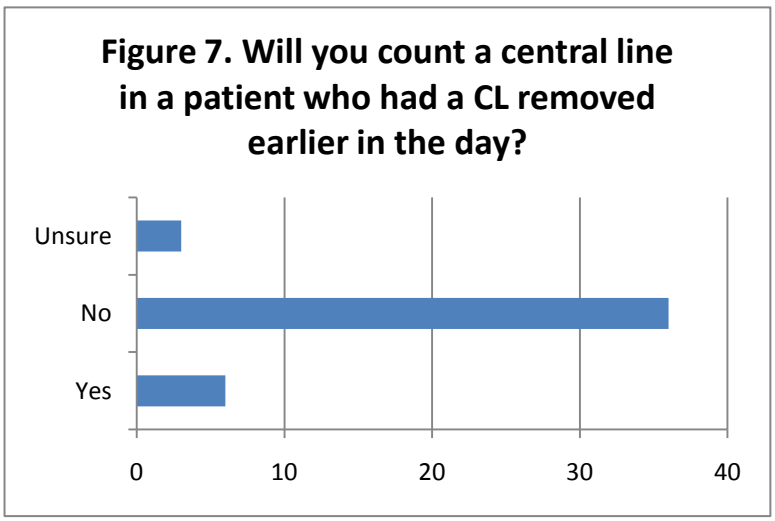


NOTE: "Electronically" usually means that each staff nurse records details about the patient central line during the course of his/her shift. Nursing staff collecting data commonly did not collect data at a specific time; data collected electronically typically includes all central lines identified during the day. Ten (10) of the 45 facilities report that the time of day collection takes place is not static. According to NHSN requirements, this is not the correct method for collecting central line days. Other reported methods of counting central line days included:

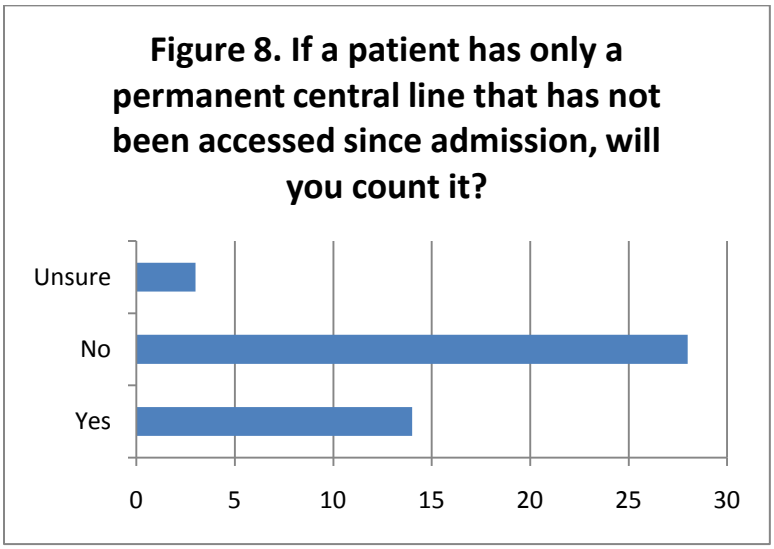
- Collected *monthly* from electronic medical record (2)
- Counted number of patients, not at the same time (3)
- Counted from CL insertion log
- No response



According to NHSN requirements, if a patient has both a temporary and a permanent line, only the temporary line is counted. Seven facilities are counting incorrectly or are not sure how to count these patients.
If a patient has more than one central line, only one central line per patient should be counted each day. Nine hospitals are incorrectly counting these days.

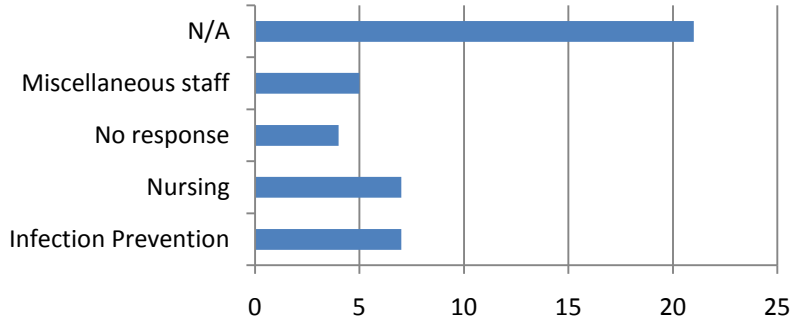


Only patients that have one or more central lines at the time the count is done should be included. Nine hospitals are unsure or counting incorrectly.



If a patient has only a permanent central line that has not been accessed (for any reason), it is not counted as a line day. On the first day it is accessed and each day after during the admission, it is counted. Seventeen hospitals are counting incorrectly or are not sure how to count these patients.

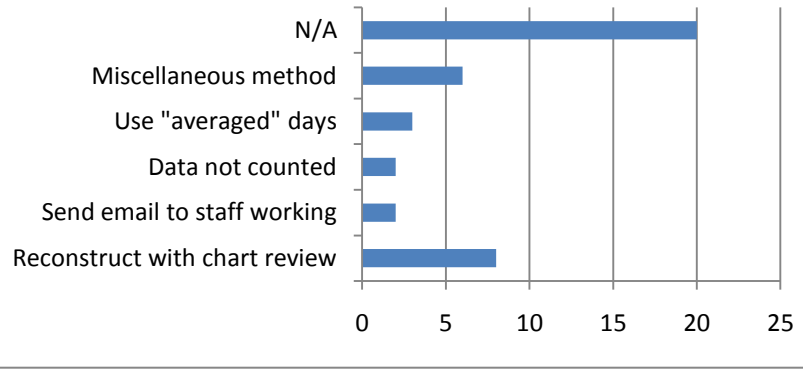
Figure 9. Who counts denominator data when the "regular" data collector is not working?



Hospitals in the Not Applicable category included facilities that have the Charge Nurse or the Unit Secretary collect the data as someone in this job description is always working. Hospitals that collect data electronically were also in this category. Responses in the "Miscellaneous staff" category included

- Several people
- Any nurse
- Running tally from Patient Care Coordinator

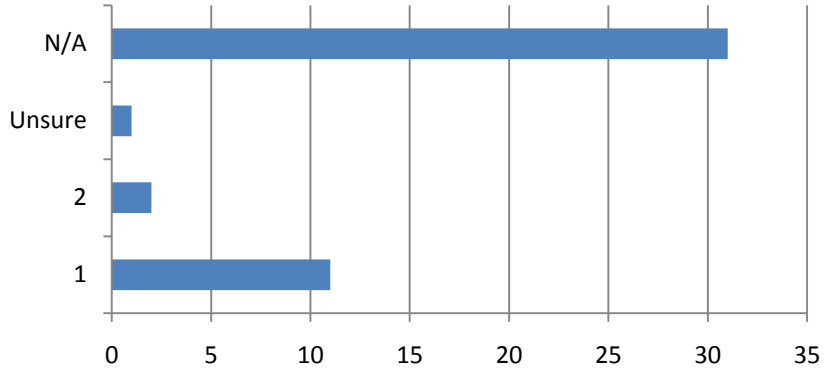
Figure 10. What do you do if nobody collected denominator data over a weekend?



These responses reflected the same line of thinking as the responses in the previous question. Note, however, that 3 facilities indicated that no lines were counted over the weekend if the data collector is not there. Miscellaneous methods cited included:

- Check daily activity sheet
- Charge nurse sheet
- IV treatment sheet
- IP does it on Monday
- Nurse Manager log book

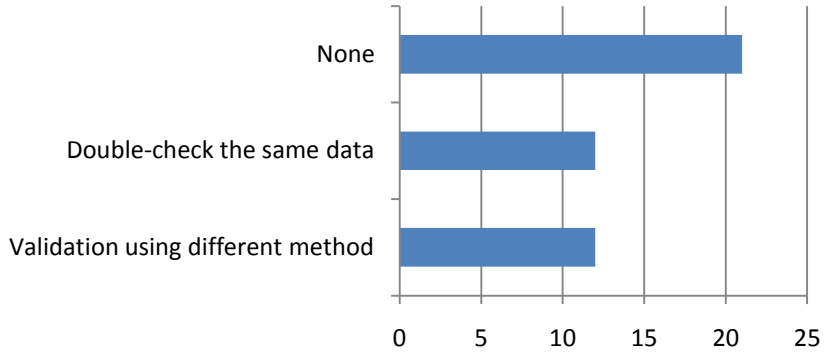
Figure 11. If a patient has both a non-umbilical and an umbilical central line, how many CL days are reported?



Only one central line per patient should be counted each day. If a patient has both an umbilical central line and a non-umbilical central line, only the umbilical central line is counted. Three hospitals are reporting this incorrectly or are unsure of how to report.

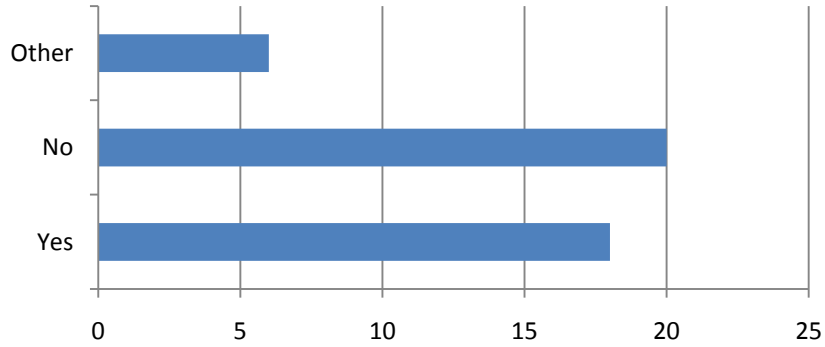
"N/A "refers to facilities that had no NICU

Figure 12. What data quality control activities are performed?



Many facilities "double check" the data using the same method as the original data collector. Most indicated that they were confident that the data was collected appropriately. Some responded with respect to the BSI, not the denominator. Twenty-one hospitals indicated that they do not perform quality control on the data.

Figure 13. Do you provide training for data collection staff?



Of the facilities that responded "Yes", the following methods were identified:

- During orientation (8)
- Ongoing training with annual review (7)
- Unspecified (3)

Facilities were counted as "No", if their response included:

- Discussions with staff
- Reports to committee
- None

Six facilities indicated that they participated in the NHSN web training.

The final question posed during the interview was, "In preparing for this audit, what challenges (if any) did you face in obtaining the positive blood culture data for submission to the MHCC? Were there other challenges?

- Twenty-one facilities indicated that obtaining the blood culture data was not difficult

- One hospital did not have access to the blood culture data in electronic format

- Other challenges cited with respect to the blood culture information included:
    - Lack of timely notification of requested information
    - IT staff had to write a program to obtain the data
    - Microbiology data had to be obtained from another location (i.e., reference lab, other hospital, corporate headquarters)
    - Limited data availability in electronic health record system
    - Two datasets had to be merged to change micro information systems
    - Yeast (candida) isolates did not show up on micro lists

- Other challenges with respect to the auditor visit and data collection included:
    - Difficulty finding documentation of central lines
    - Lack of timely notification of the interview
    - Difficulty locating all sections of the paper chart
    - Difficulty working with the combination of electronic and paper records

Discussion of Interview Results

Responses to some of the interview questions suggest that certain questions were not clearly developed and left room for misinterpretation. Auditors commented that informal discussions held with the Infection Preventionists prior to the formal interview process may have served to "give away" some of the answers to the interview questions. In addition, the auditors found that some of the responses to questions were correct, but further evaluation of audit results suggested that the hospital was not using the appropriate methodology. Highlights of the interviews held at the conclusion of the on-site review are summarized below:

- Many facilities report collection of patient days electronically, which seems appropriate given that the reported numbers are often based on a "Midnight Census". This corresponds with NHSN protocol for the collection of patient days.

- The NHSN protocol for the collection of central line days was not adhered to by all hospitals interviewed:
    - Many hospitals reported collecting line days electronically. In most cases, this "electronic" reporting was derived from the electronic medical record where each staff nurse records information about the central line. This nursing note is reported at some time during the shift, but not necessarily "at the same time". This type of counting is more likely to count all lines that were on the unit during the day and could be an overestimation of line days, resulting in overall lower CLABSI rates.
    - Training for data collectors (Staff Nurses, Charge Nurses, and Secretaries) is limited and inconsistent. IPs who were interviewed often knew how central lines should be collected, but did not follow through with staff training. Some staff had training once, but it had never been repeated or introduced to new staff. There were comments that "the nurses know how to do it", but conversations with nursing often did not support this belief.
    - Some hospitals reported appropriate methods for validating the denominator data (e.g., spot checking electronic reports with periodic manual checks), but most did not. NHSN allows the collection of denominator data electronically, but stipulates that electronic and manual data collection should take place simultaneously for a period of time and that the resulting difference between the two methods should not exceed ±5%.

- Only a few facilities indicated that they did not have the electronic resources to easily prepare the required blood culture results. Only one hospital did not store the information electronically, but several others indicated that the information was gathered by merging data from various systems. Many facilities indicated that a customized program was written to generate the required blood culture data (this was expected).
    - Some facilities indicated that preparation for the visit was complex because patient records were both in electronic and paper format.
    - Several facilities felt that additional time should have been provided to prepare for the audit.

    - Some facilities felt that the directions governing the hospital staff responsible for assisting the auditor were confusing and resolved questions by calling MHCC.

- Auditors were instructed to use the experience to find "teachable moments" where gaps in knowledge existed. Documented teaching included:
    - Per NHSN requirements, patient days and central line days should be counted at the same time each day;
    - Only one line day is counted for each patient each day;
    - NHSN training is required for all users in the system;
    - NHSN definitions for blood stream infections were revised in January 2008 and the differences between old and new definitions were discussed;
    - There is no 48 hour rule for determining if an infection is an HAI.

- Additional comments from auditors included:
    - Most hospitals had made arrangements as instructed for an individual with knowledge of the patient record to assist in the audit. This resource greatly facilitated the audit process. A few hospitals were not prepared for the auditor upon arrival resulting audit delays – in at least one situation, the record in question was in a warehouse off-campus and, when received, was not complete.
    - A few hospitals had comprehensive electronic medical records (EMR) systems, but most were a combination of EMR and paper records.

Audit Limitations

- Resources for this audit were limited to a review of 200 patient records. Determination of an appropriate sample size is difficult and the sample size (202) is too small to draw statistically significant conclusions about the validity of CLABSI data reported to NHSN.
- Ideally, each patient record should have been reviewed by two separate individuals. Again, available resources did not allow for this level of analysis. The Project Director was, however, available to resolve discrepancies and to answer questions.
- Selection of ICUs for audit was not risk adjusted. Neither location type for ICUs nor birth weight categories for NICU were considered when creating the initial ICU Ranking List. This could have possibly selected out higher-risk ICUs for audit.

Appendices

Appendix I
Letter to Hospital CEOs Regarding the CLABSI Audit

STATE OF MARYLAND

Marilyn Moon, Ph.D.
CHAIR

Rex W. Cowdry, M.D.
EXECUTIVE DIRECTOR

MARYLAND HEALTH CARE COMMISSION
4160 PATTERSON AVENUE – BALTIMORE, MARYLAND 21215
TELEPHONE: 410-764-3460 FAX: 410-358-1236

MEMORANDUM

TO: Maryland Hospital Chief Executive Officers

FROM: Pamela W. Barclay, Director
Center for Hospital Services

DATE: October 19, 2009

RE: Central Line-Associated Bloodstream Infection (CLABSI) On-Site Chart Audit

---

Later this month, the Commission will begin work to conduct an on-site chart audit of the Central Line-Associated Bloodstream Infection (CLABSI) data reported by your hospital for the 12-month period, July 1, 2008-June 30, 2009. The purpose of the audit is to: (1) assess the accuracy and completeness of selected CLABSIs reported for patients in ICUs; (2) determine whether selected cases reported to the Commission meet criteria established by the Centers for Disease Control and Prevention (CDC) for the National Healthcare Safety Network (NHSN) system; and, (3) evaluate current surveillance methods to detect infections and report associated denominator data. I am writing to provide background on this project, outline the steps involved in conducting the audit, and review the timeline.

Background

As you know, the Maryland General Assembly adopted legislation requiring the Commission to add information on Healthcare -Associated Infections (HAI) to the data publicly reported in the Hospital Performance Evaluation System. To fulfill this legislative mandate, the Commission requires that all hospitals participate in the NHSN system. NHSN is a secure, internet-based surveillance system with components addressing patient and health care personnel safety managed by the CDC. The first phase of HAI data collection through the NHSN surveillance system in Maryland began July 1, 2008 with the reporting of CLABSI data in all Intensive Care Units (i.e., all units defined as inpatient adult critical care and pediatric critical care; and, units defined as neonatal critical care- according to the *NHSN Manual: Patient Safety Component Protocol)*. All Maryland hospitals with ICU beds are submitting CLABSI data on a monthly basis to the Maryland Health Care Commission.

Overview: Central Line-associated Bloodstream Infection (CLABSI) On-Site Chart Audit

To ensure the accuracy and completeness of this information, the MHCC will conduct an on-site chart review of CLABSIs at each hospital. The Commission has engaged the services of the APIC Consulting Group, Inc. to perform the on-site audit. The APIC auditors are Infection Preventionist (IP) professionals with significant experience in HAI prevention, detection, and surveillance. The on-site chart review plan, which has been developed with assistance from the Commission's HAI Advisory Committee, will include the review of no more than 5 medical record charts of ICU patients treated in your hospital. The Commission will not publicly report your CLABSI data until the audit has been completed and each hospital has been given the opportunity to review and comment on the results. Each hospital will also have the opportunity to preview its data prior to its release on the Hospital Performance Evaluation Guide.

Next Steps and Timeline

MHCC will contact your hospital Infection Preventionist (IP), via e-mail, to request submission of a list of positive blood cultures (laboratory data) drawn from ICU patients with selected data elements for the time period under review (i.e., July 1, 2008 – June 30, 2009). The Commission requests that the laboratory data be submitted by Friday, October 30, 2009. To facilitate submission of the positive blood culture data, the Commission will establish a secure, password protected website. Detailed information on laboratory data elements to be reported and transmission requirements will be forwarded to your IP. Pending review and analysis of hospital lab data submissions, the Commission will begin scheduling on-site reviews in mid-December. We anticipate 1-2 days for completion of chart reviews in each hospital.

If you have any questions regarding the CLABSI chart review process, please contact me (410-764-5982) or Theressa Lee, Chief, Hospital Quality Initiatives (410-764-3328). We look forward to working with you and your staff to publicly report accurate and meaningful HAI information.

cc: Hospital Infection Preventionists
HAI Advisory Committee

Appendix II

E-Mail to Hospital Infection Preventionists Regarding Site Visit Schedule

E-mail Regarding the Scheduling of On-Site Hospital Audits

To: All Hospital Infection Preventionists
Date: November 17, 2009
Subject: Scheduling Site Visits to Conduct the Central Line-Associated Bloodstream Infection (CLABSI) On-Site Chart Audit

Over the past several weeks, the Commission has been working with Maryland hospitals to prepare for the on-site chart audit of the Central Line-Associated Bloodstream Infection (CLABSI) data reported for the 12-month period, July 1, 2008-June 30, 2009. The on-site chart review plan, which has been developed with assistance from the Commission's HAI Advisory Committee, will include the review of no more than 5 medical record charts of ICU patients treated in your hospital. We appreciate your assistance in providing data on positive blood cultures drawn from ICU patients at your hospital for the reporting period. I am writing to provide information concerning scheduling of the site visits for the on-site chart reviews.

Scheduling of Site Visits

The Commission has engaged the services of the APIC Consulting Group, Inc. to perform the on-site audit. The APIC auditors are Infection Preventionist (IP) professionals with experience in HAI prevention, detection, and surveillance. The Commission would like to schedule site visits on the following days:

Wednesday, December 9, 2009
Thursday, December 10, 2009
Friday, December 11, 2009
Monday, December 14, 2009
Tuesday, December 15, 2009
Wednesday, December 16, 2009
Thursday, December 17, 2009
Friday, December 18, 2009

Please use the enclosed form to indicate all of the days that your hospital would be available for the on-site CLABSI audit. We will attempt to schedule your on-site visit on a date that is convenient for you and your staff. Your hospital should designate a staff person to serve as the Audit Liaison. The Audit Liaison will be responsible for handling the logistics of the audit, greeting the auditor upon arrival at the hospital, facilitating access to medical records, and arranging for the auditor to interview key staff involved in the collection of CLABSI numerator and denominator data. The Audit Liaison should not be the person responsible for collecting CLABSI data. You should plan for the auditor to be on-site for one full day. Once the site visits have been scheduled, additional information and a more detailed schedule will be provided to each hospital. The auditor will take a break for lunch, as required, using public food services available at the hospital.

We would appreciate it if you could return the enclosed form no later than **Friday, November 19, 2009**. Commission staff will contact each hospital regarding the site visit schedule and requirements in the next week. If you have questions, please contact me at 410-764-3328 or Eileen Witherspoon at 410-764-3257. We look forward to working with you on the CLABSI audit project.

Theressa Lee
Chief, Hospital Quality Initiatives
Maryland Health Care Commission
4160 Patterson Avenue
Baltimore, Maryland 21215
Telephone: 410-764-3328
FAX: 410-358-1311

MARYLAND HEALTH CARE COMMISSION

Scheduling Form
On-Site CLABSI Chart Audit

Hospital Name: _____

Name and Title of Audit Liaison: _____

Telephone: _____

Fax: _____

E-mail: _____

*Indicate below **all** times that your hospital would be available for the on-site CLABSI audit.*

December 2009

Day	Date	Available	Not Available
Wednesday	December 9, 2009		
Thursday	December 10, 2009		
Friday	December 11, 2009		
Monday	December 14, 2009		
Tuesday	December 15, 2009		
Wednesday	December 16, 2009		
Thursday	December 17, 2009		
Friday	December 18, 2009		

Please fax the completed form to Colleen Lates at 410-358-1311 or call 410-764-3232. Your response by Friday, November 20, 2009 would be appreciated.

Appendix III

E-Mail to Hospital Infection Preventionists Regarding Positive Blood Culture Data

E-mail Regarding Positive Blood Culture Data Reporting

To: All Hospital Infection Preventionists
Date: October 21, 2009
Subject: On-site CLABSI Data Audit
Attachment: Positive Blood Culture Data Format

As you are aware, the MHCC will be conducting an on-site chart audit of Central Line Associated Bloodstream Infection data (CLABSI) at each facility. The purpose of the on-site review is to assess the accuracy and completeness of the CLABSI data and to create opportunities for data quality improvement. We have engaged the services of the APIC Consulting Group to perform the on-site audit. The on-site audit will include the review of no more than 5 medical charts of ICU patients treated in your facility. The Commission will not publicly report your CLABSI data until the audit has been completed and each hospital has been given the opportunity to review and comment on the results.

The first step in the audit process will include a review of all positive blood cultures performed on your ICU patients. Therefore, we are requesting that you submit a list of positive blood cultures drawn from ICU patients for the time period under review (i.e., July 1, 2008 – June 30, 2009). The list should be submitted in electronic Excel spreadsheet format and should include the patient medical record number, type of ICU, the specimen collection date, the specimen collection time, and test results. The Positive Blood Culture Data File Format is attached for your information. Please note that a memorandum, dated October 19, 2009 from Pam Barclay, Director of the Center for Hospital Services to Hospital CEOs, included a target deadline of October 30th for submission of your blood culture data. However, the deadline for the submission of the data has been extended until **November 6, 2009**, to permit a 2 week turnaround period for this data collection activity.

MHCC has established a secure method for transmitting this laboratory data to the Commission to ensure compliance with state and federal data confidentiality and security requirements. Detailed information on data transmission requirements will be forwarded to you in a separate email. Pending review and analysis of your lab data submissions, we plan to begin scheduling on-site reviews in mid-December and we anticipate 1-2 days for completion of chart reviews (4-5 charts) in each facility.

If you have any questions regarding the CLABSI chart review process, please contact me (410-764-3328) or Eileen Witherspoon (410-764-3257). We look forward to working with you on this important project.

Theressa Lee
Chief, Hospital Quality Initiatives
Maryland Health Care Commission
4160 Patterson Avenue
Baltimore, Maryland 21215
Telephone: 410-764-3328
FAX: 410-358-1311

Positive Blood Culture List for All Patients in All ICUs - July 1, 2008 thru June 30, 2009					
NHSN Assigned Facility Identifier	**Medical Record Number [1]**	**ICU Type[2]**	**Specimen Collection Date (mmddyyyy) [3]**	**Specimen Collection Time (hhmm) [4]**	**Test Result/Organism [5]**

[1] The Medical Record Number must be the patient identifier used for NHSN and HSCRC data reporting. The unique medical record number is assigned permanently to the patient and may not change regardless of the number of admissions for that particular patient during the patient's lifetime.

[2] ICU Type refers to the specific intensive care unit the patient was in at the time of the specimen collection (e.g., NICU, CCU, MSICU).

The ICU Type will be hospital-specific as each hospital names their ICU(s) in NHSN.

[3] The Specimen Collection Date is the date the specimen was taken from the patient. Enter the month, day and year for each culture as mmddyyyy.

[4] The Specimen Collection Time is the time the specimen was taken from the patient. Enter the time using the military (24-hour) clock.

[5] The test result/organism is the recognized pathogen or common skin contaminent identified as a result of the blood draw.

Appendix IV

Letter to CLABSI Audit Contact Regarding Audit Process and Records to be Reviewed

MARYLAND HEALTH CARE COMMISSION

4160 PATTERSON AVENUE – BALTIMORE, MARYLAND 21215
TELEPHONE: 410-764-3460 FAX: 410-358-1236

December 3, 2009

Hospital Contact
Hospital Address

Re: CLABSI Data Audit

Dear Ms. Smith:

As you are aware, the Maryland Health Care Commission (MHCC) has engaged the services of APIC Consulting Services, Inc. (ACSI) to perform an on-site chart review of the Central Line-Associated Bloodstream Infection (CLABSI) data submitted through the NHSN surveillance system for the period July 1, 2008-June 30, 2009. This letter is written to provide you with necessary information regarding the audit process.

Your on-site visit has been scheduled for **Wednesday, December 9, 2009**. **Ms. _____**, from ACSI has been assigned to your facility. The ACSI consultant will contact you in advance to make final arrangements for the site visit, including start time and meeting location and parking. Please note that the audit will include the review of patient records from one of your ICUs and conclude with an interview with all individuals from your facility who collect CLABSI data (i.e., infections, patient days, and central line days) for the **ICU**. The purpose of the interview is to collect information on CLABSI data collection practices at your facility.

The CLABSI audit will include a review of the patient records listed below. We have also provided the specimen collection date or date the CLABSI was identified to assist you in pulling the targeted records. The Commission does not have access to the date the patient was discharged from the hospital. It is estimated that this chart review will be completed in the morning, but may continue into the early afternoon if necessary.

M.R. Number	Date (Event or Specimen Collection)
xxxxxxx	0/0/2009
xxxxxxx	0/0/2009
xxxxxxx	0/0/2009

xxxxxxx	0/0/2008
xxxxxxx	0/0/2009

As stated previously, the auditor will conduct an interview with the hospital staff that collect CLABSI data on a regular basis. An appropriate location (e.g., classroom or conference room) should be available for the interview. The IP staff and individuals from the ICU being audited who collect data about patient days and central line days should be included in the interview. Others from the hospital may be included at your discretion. We anticipate that the interview process will last approximately one hour.

As you know, the purpose of this chart review is to ensure the accuracy and completeness of the CLABSI data that is currently reported by hospitals to the Commission through NHSN. The Commission will not publicly report your hospital's CLABSI data until this audit is complete and each hospital has been given the opportunity to review and comment on the results.

If you have any questions about the on-site audit, please call or email Theressa Lee (tlee@mhcc.state.md.us or 410/764-3328) or Eileen Witherspoon (ewitherspoon@mhcc.state.md.us or 410/764-3257). Thank you for your efforts and continued cooperation in this important initiative.

Sincerely,

Pamela W. Barclay
Director, Center for Hospital Services

Appendix V

Letter to Infection Preventionists with CLABSI Audit Results Form

STATE OF MARYLAND

MARYLAND HEALTH CARE COMMISSION

4160 PATTERSON AVENUE – BALTIMORE, MARYLAND 21215
TELEPHONE: 410-764-3460 FAX: 410-358-1236

February 25, 2010

Hospital
Maryland

Re: CLABSI Data Audit Results

Dear Ms._____ :

As you know, the Maryland Health Care Commission (MHCC) recently conducted an on-site chart review of the Central Line-Associated Bloodstream Infection (CLABSI) data submitted through the NHSN surveillance system for the period July 1, 2008 through June 30, 2009. The chart reviews have been completed and the results for your hospital are included in the attached *CLABSI Summary of Findings* Form.

The *CLABSI Summary of Findings* form highlights any discrepancies found by the auditor and includes a detailed description of the discrepancy under the Comment Section. If any reporting discrepancies were identified for your hospital, either CLABSIs incorrectly reported or unreported CLABSIs, please add or delete these entries through the NHSN system by **Monday, March 15, 2010**. These changes can be made in the same manner you add or delete new CLABSIs in NHSN.

The MHCC appreciates the level of cooperation received from hospitals throughout this data review process. We have gained a better understanding of the issues surrounding CLABSI data collection and we believe this project will significantly enhance the overall quality of the data as we move forward with public reporting of this important information.

If you have any feedback or questions, please contact me (410-764-3328 or tlee@mhcc.state.md.us) or Eileen Witherspoon (410-764-3257 or ewitherspoon@mhcc.state.md.us).

Sincerely,

Theressa Lee

Theressa Lee
Chief, Hospital Quality Initiatives

On-Site Chart Review of
Central Line Associated Bloodstream Infection Data
Summary of Findings
February 2010

Hospital Name:

Auditor:

Date of Audit:

Number of Records Reviewed:

Findings:

Discrepancies:	
# CLABSIs identified by auditor but not reported by hospital	0
# CLABSIs reported by hospital but not confirmed by auditor	0
Agreements:	
# CLABSIs reported by hospital and confirmed by auditor	0
# Records with no CLABSI reported and confirmed by auditor	0

Comments:

This audit did not find any discrepancies between the data that was reviewed on the above date and the events that you reported to NHSN during the time period of July 1, 2008 through June 30, 2009.

Thank you for your cooperation with the Maryland Health Care Commission in making this effort successful.

Appendix VI

Survey on CLABSI Data Collection Practices

Survey on CLABSI Data Collection Practices

Site Visit Date: ___/___/_____

Hospital Name: _____

Name and Title of Person(s) Interviewed: (Interview Attendance Sheet)

_____

Chart Auditor:_____

1. Number and Types of ICUs

NHSN ICU/NICU Type	ICU/NICU Name	Number of Staffed and Available Beds(As of July 1, 2008)	Number of Staffed and Available Beds (As of June 30, 2009)

2. Were there any changes in the number and/or organization of ICU units during the reporting period? If yes, please describe and indicate how those changes were reflected in reporting to NHSN.

3. Do you have more than one Medical-Surgical ICU? If yes, how do you report to NHSN for those ICUs?

4. Who collects data on ICU patient days?

5. How is data on **ICU patient days** collected ? (verify documentation)

   __ Electronically – collected by facility and provided to IP

   __ Manually collected by Infection Prevention staff

   __ Manually collected by staff in ICU location

   __ Other (specify)

   Comments:

6. Identify the method used to count ICU **patient days**:

   __ At the same time each day, count the number of patients on the unit (e.g., midnight census)

   __ Count the total number of patients that were cared for in the ICU on a given day

   __ Count the number of admissions for the day

   __ Other (specify):

   Comments:

7. Who collects the data on ICU **central line days**? :

8. How are ICU **central line days data** collected? (verify documentation):

   __ Electronically – collected by electronic medical record

   __ Manually collected by Infection Prevention staff

   __ Manually collected by staff in ICU location

   Comments:

9. Identify the method used to count ICU **central line days**:

   __ At the same time each day, count the number of patients on the unit with one or more central lines

   __ Count the total number of central lines that were maintained in the ICU that day

   __ Other (specify):

   Comments:

10. Who counts patient days and central line days when the "regular" data collector is not working?

11. What do you do if nobody collected this information over a weekend?

12. How are peripheral IV's counted?

13. If a patient has 2 separate central lines, how many central line days are counted?

14. If a patient has a temporary central line and a permanent central line, how many central line days are counted?

15. If, at the time central lines are counted, you know that a patient had a line removed earlier in the day, will you count the patient as having a central line?

16. If a patient has only a permanent central line (e.g., port-a-cath) and the line has not been accessed since admission, is it counted in the central line days?

17. If a patient has both a non-umbilical and an umbilical central line, how are central line days reported?

18. How are birthweight classifications identified?

19. What data quality control activities are performed?

20. Do you provide any ongoing or periodic training for staff involved in data collection and reporting?

21. In preparing for this audit, what challenges (if any) did you face in obtaining the positive blood culture data for submission to the MHCC? Were there other challenges?

CLABSI Chart Review

Hospital Name: _____

Date:_____

Interview Attendance Sheet

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