2173. Suspending Use of Contact Precautions in Patients Colonized with Methicillin-Resistant Staphylococcus aureus in a Level III Neonatal ICU and Its Effects on Rates of Transmission
Tiffany Dogan, MPH, CIC; Alexandre Hayward, MPH; Sreelatha Ponnaluri-Wears, MPH, CIC; Elizabeth Lloyd, MD; Amanda Valykos, MPH, CIC and Terri Stillwell, MD. 1Department of Infection Prevention and Immunology, Michigan Medicine, Ann Arbor, Michigan; 2Department of Pediatrics, Michigan Medicine, Ann Arbor, Michigan
Session: 242. HAI: MRSA, MSSA, and Other Gram-positives
Saturday, October 7, 2017: 12:30 PM
Background. There is limited evidence to support whether contact precautions (CP) for MRSA-colonized patients in a Neonatal ICU (NICU) reduces rates of transmission, given current endemic MRSA. This study assesses rates of hospital-associated MRSA (HA-MRSA) in the NICU before and after discontinuation of CP for patients colonized with MRSA.
Methods. Active screening for MRSA colonization occurs on admission and weekly for all NICU patients. Clinical infections were identified on routine cultures. Decolonization with Mupirocin and Chlorhexidine bathing was done for all MRSA-positive patients. Rates of HA-MRSA pre, during, and post CP suspension were assessed. MRSA isolates from before and after the contact precautions suspension period were saved and sent for pulse-field gel electrophoresis (PFGE). PFGE results from previous clusters of HA-MRSA isolates were also reviewed. Furthermore, 11 highly-ranked level III NICUs were surveyed to compare infection prevention practices for MRSA isolation. Overt hand hygiene auditing, family education, and enhanced environmental cleaning were in place during the entire study timeframe.
Results. Rate of HA-MRSA during 6 month pretrial, 2 month suspension period, and 3 month post-trial was 0.94, 2.24, and 1.05 per 1000 patient-days respectively. During previous outbreaks 14 isolates were sent for PFGE testing resulting in 2 isolates matching. Six isolates from the CP suspension period resulted in 2 matching pairs. Three isolates from post-trial were different from each other and from previous isolates. Survey results revealed 100% of facilities use CP for MRSA-positive patients. Three of 11 NICUs have a decolonization protocol in place, while 10 actively screen for MRSA.
Conclusion. Preliminary results demonstrated an increase in HA-MRSA after suspending CP for MRSA-colonized patients. According to the survey results, the standard of care appears to be the use of CP for all MRSA-positive patients, although decolonization practices varied. Given the limited size of our study, more data is needed to determine whether CP is necessary to prevent transmission of HA-MRSA in the presence of an active screening and decolonization program, a robust hand hygiene program, and enhanced environmental cleaning in the NICU setting.
Disclosures. All authors: No reported disclosures.

2174. Risk of Methicillin-Resistant Staphylococcus aureus (MRSA) Infection during a Hospitalization among MRSA Carriers and Non-Carriers in the Absence of Contact Isolation
Nabin Shrestha, MD, MPH, FIDSA, FSHEA1 and Thomas G. Fraser, MD, FSHEA1 and Steven Gordon, MD; 1Infectious Disease, Cleveland Clinic, Cleveland, Ohio
Session: 242. HAI: MRSA, MSSA, and Other Gram-positives
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Background. Contact isolation of methicillin-resistant Staphylococcus aureus (MRSA) carriers is designed to “protect” non-carriers from MRSA infection. The Cleveland Clinic does not place MRSA carriers in contact isolation. The purpose of this study was to examine the value of contact isolation by comparing the risk of MRSA infection in MRSA carriers and non-carriers, in the absence of contact isolation.
Methods. Adult patients hospitalized at Cleveland Clinic from Jan 1, 2008 to December 31, 2015, who were tested for S. aureus colonization by PCR or culture of a nasal swab at least once during the hospitalization were screened for inclusion. Only the first hospitalization per patient was considered. Included patients were divided into MRSA carriers and non-carriers, based on the result of their first nasal MRSA test result. Among these patients, the risk of subsequent MRSA bloodstream infection (BSI) and non-bacteremic MRSA infection during the same hospitalization were determined, and compared, for non-carriers vs. carriers.
Results. Of 74595 patients identified, 1223 were excluded because they had a S. aureus infection within 3 days of admission to the hospital. Of the remaining 73372 patients, 5% were MRSA carriers. One hundred and twenty (0.2%) of 69452 non-carriers developed an MRSA infection during the same hospitalization compared with 82 (2.1%) of the 3920 MRSA carriers (RR 0.08, 99% CI 0.06–0.12, p-value 3.62 x 10^-11). Relative risks were very similar when analyzed separately for bacteremic and non-bacteremic infection. A Monte Carlo simulation with 1000 trials simulating corrections needed to determine whether CP is necessary to prevent transmission of HA-MRSA in the presence of an active screening and decolonization program, a robust hand hygiene program, and enhanced environmental cleaning in the NICU setting.

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Eli Perencvich, MD, MS, FIDSA, FSHEA and Christopher Crenich, MD, PhD

1Infectious Disease, University of Wisconsin-Madison School of Medicine and Public Health, Madison, Wisconsin, 2William S. Middleton Memorial Veterans Hospital, Madison, Wisconsin, 3University of Iowa Carver College of Medicine, Iowa City, Iowa, 4Department of Internal Medicine, University of Iowa Carver College of Medicine, Iowa City, Iowa, 5Division of Infectious Disease, Madison VA Medical Center, Madison, Wisconsin, 6Madison VA Medical Center, Madison, Wisconsin, 7Iowa City VA Health Care System, Iowa City, Iowa, 8Division of Infectious Disease, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin

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Background. Colonization with Staphylococcus aureus (SA) increases the risk of surgical site infection (SSI) and de-colonization reduces this risk depending on level of patient adherence. Our VA facility's participation in a multi-site study to identify the best strategies for implementing peri-operative SA de-colonization provided an opportunity to examine the reliability of existing internal processes. The objectives of this single-site study were to assess self-reported patient adherence, and barriers to recommended de-colonization procedures, as well as to examine if current patient educational materials were sufficient.

Methods. A survey measuring self-reported adherence and barriers to recommended de-colonization procedures was administered by telephone. A process map of the patient education process was employed to identify key frontline staff who were asked to review existing patient education materials and procedures. A new patient education tool was then developed with their input and input from an expert in patient education.

Results. 34 patients responded to the telephone interview. Self-reported de-colonization adherence was 100%. 32% of patients reported high levels of social/economic deprivation and only 32% reported using medication reminders, suggesting some risk of non-adherence. Process mapping revealed that patient education was delivered through a combination of face-to-face training and printed materials. Review of the printed materials identified a number of opportunities for improvement. The newly developed patient education tool was rewritten at a 7th grade reading level and revised to include: (1) more concrete information on the benefits of SA de-colonization; (2) visual aids to enhance performance of different de-colonization tasks; and (3) a tracking log to facilitate adherence to each of the recommended de-colonization tasks.

Conclusion. We identified many opportunities to improve the education of patients undergoing SA de-colonization prior to high-risk surgery at our VA. Further work will be done to determine whether these changes positively impacted patient adherence to recommended de-colonization procedures and whether this translates into improved patient outcomes.

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2177. Electronic Detection of MRSA Infections in a National VA Population: Augments Current Manual Process
Judith Strymish, MD, MS; Makoto Jones, MD, MS; Martin Evans, MD, FIDSA, FSHEA; Weyn Branch-Elliman, MD; Ernst Robillard, RN; Jeffrey Chan, BS; Amy Rosen, PhD and Kalpana Gupta, MD, MPH; VA Boston Healthcare System, West Roxbury, Massachusetts, 2Harvard Medical School, Boston, Massachusetts, 3Department of Medicine, University of Utah School of Medicine, Salt Lake City, Utah, 4Internal Medicine, VA Salt Lake City Health Care System, Salt Lake City, Utah, 5Division of Infectious Diseases, Department of Internal Medicine, University of Kentucky College of Medicine, Lexington, Kentucky, 6Lexington Veterans Affairs Medical Center, Lexington, Kentucky, 7Veterans Health Administration, MRSA/MDRO Prevention Office, National Infectious Diseases Service, Patient Care Services, Veterans Affairs Central Office, Lexington, Kentucky, 8Center for Healthcare Organization and Implementation Research (CHOIR), Boston, Massachusetts, 9Patient Safety Center of Inquiry (PSCI) on Measurement to Advance Patient Safety, Boston, Massachusetts, 10Boston University School of Medicine, Boston, Massachusetts

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Background. Automated measurement of hospital-acquired infections (HAIs) can improve the efficiency and reliability of surveillance. Within the VA, automatic MRSA HAIs are manually reviewed and reported to the Inpatient Evaluation Center (IPEC). These MRSA HAI metrics are used as part of facility rankings to compare quality. However, IPEC uses CDC surveillance definitions which may vary in interpretation across facilities and not reflect all clinically relevant MRSA events. Thus, we sought to compare this manual process to a previously-developed electronic algorithm for detecting clinical MRSA infections to evaluate whether the algorithm could be used to expand MRSA surveillance activities.

Methods. Electronic data were extracted from the national VA healthcare system during the period from January 1, 2014–December 31, 2014. The electronic detection algorithm defined MRSA infections as a culture positive for MRSA from a sterile site or from a non-sterile site with receipt of an antimicrobial with MRSA activity ≥ 5 days from the date of culture collection. Cultures obtained ≥48 hours after admission were classified as HAI.

IPEC data for five facilities were extracted and IPEC rates were compared with rates estimated by the electronic algorithm. Plagged infections at one facility were manually reviewed to evaluate any discordances.

Results. N = 14,260 MRSA clinical cultures were identified in 9,209 unique patients. Of these, 1,703 met definition for MRSA HAI infection.

Electronic algorithm detected MRSA HAI rates varied widely across 137 facilities (Figure 1), ranked by rate per 1,000 patient-days. IPEC rates were universally lower than estimates derived using the MRSA electronic detection tool. Discordance in the estimates was attributable to infections present on admission, differences in capture of surgical site infections, and differences between clinical and surveillance definitions of infection.

Conclusion. Applying the MRSA algorithm provided additional information about the burden of MRSA infections across the VA. This algorithm could be used as a tool to complement IPEC reporting and further inform infection prevention activities.

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2178. Developing a Checklist to Identify and Manage MRSA Outbreaks in the Neonatal ICU using a Multi-Disciplinary Approach
Karen Southwick, MD, MS; Kathleen Gibbs, MD; Monica Quinn, RN, MS; Belinda Drotzsky, MD, MPH, FIDSA, FSHEA; Eleanor H. Adams, MD, MPH; Lisa Saiman, MD, MPH; 2Healthcare Epidemiology and Infection Control, New York State Department of Health, New Rochelle, New York, 3Pediatrics, Mount Sinai Hospital, New York, New York, 4Health Care Epidemiology and Infection Control, New York State Department of Health, Albany, New York, 5Department of Medicine, Division of Infectious Diseases, Montefiore Medical Center, Bronx, New York, 6Pediatric Infectious Diseases, Columbia University Medical Center, New York, New York

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Background. From 2001 to 2015, the New York State Department of Health (NYSDOH) received 241 hospital-associated infection reports from neonatal ICUs (NICUs); 72 (29%) were caused by methicillin-resistant Staphylococcus aureus (MRSA) and involved 390 babies at initial report. Given this MRSA burden and variability in outbreak response, a checklist was developed to help NICU’s identify and manage MRSA outbreaks. NYSDOH and academic partners conducted a workshop to teach NICU multidisciplinary teams these skills.

Methods. The checklist committee were members of the NYSDOH and academic subspecialists in infectious disease, infection control and neonatology from three medical centers in NYC; all of whom had reported MRSA outbreaks within the past year. The committee met twice monthly for 6 months and developed the checklist as a practical tool for a multidisciplinary care team to implement existing guidelines. A checklist draft was distributed during the NYSDOH’s one-day workshop to Control and Prevent MRSA Outbreaks, attended by 73 individuals from 25 NICUs in the NYC metropolitan region. Attendees provided feedback to modify the checklist.

Results. The checklist has 10 sections including guidance about developing a case definition and line list; reporting to the NYS DOH; managing census; communicating with local microbiology laboratories, interdisciplinary teams, families, and employee health service; using transmission-based precautions, obtaining surveillance cultures, cohorting infants and staff, and improving environmental cleaning. Implementation strategies are emphasized, e.g., evaluate effectiveness of environmental cleaning and disinfection practices and empower staff to observe and enforce hand hygiene compliance. Practical tips are provided, e.g., assess equipment shared with other units, review clinical cultures for patterns suggestive of acquisition route, take a non-punitive approach with MRSA-positive staff, perform environmental cultures if other strategies fail to stop transmission.

Conclusion. Checklists facilitate healthcare delivery. This is the first comprehensive checklist designed to reduce MRSA burden in NICUs. Future work will assess the impact of the checklist on reporting and outbreak size and duration.

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