

Presentation Number 14-222

## **Effect of Methicillin-Resistant *Staphylococcus aureus* Bundle Approach in a Surgical Intensive Care Unit**

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**Background:** Methicillin-resistant *Staphylococcus aureus* (MRSA) is the major pathogen of nosocomial infections in intensive care units (ICUs). The MRSA bundle approach has been reported as an effective method to reduce MRSA infections. The MRSA bundle has five infection control strategies: an active surveillance culture, contact precaution, hand hygiene, decontamination of the environment and equipment, and device bundles (a central line bundle and a ventilator bundle).

**Objectives:** The purpose of this study is to evaluate the effect of the MRSA bundle approach in reducing MRSA infections or colonizations in a surgical ICU at a university hospital.

**Methods:** The subjects for this study were 350 patients who were hospitalized at the SICU from January 1 to April 30 of 2008. The MRSA bundle approach for this study consisted of an active surveillance culture, hand hygiene, contact precaution, and decontamination of the environment and equipment. The MRSA incidence rate and MRSA nosocomial infection rate during the pre-intervention period (from September 1 to December 31 of 2007) and those of the intervention period were compared to identify the effect of the MRSA bundle approach. Data were analyzed by the Chi-square test, t-test using the statistical software program SPSS (ver. 12.0). Statistical significance was accepted at the level of  $p < .05$ .

**Results:** MRSA was newly isolated from clinical specimens in 31 patients (9.8%) during the pre-intervention period; therefore, the incidence rate of MRSA was 11.9 cases per 1000 patient-days during the pre-intervention period. And MRSA was newly isolated from clinical specimens in 21 patients (5.4%) during the intervention period; thus, the incidence rate of MRSA was 7.6 cases per 1000 patient-days during the intervention period ( $p = 0.040$ ). MRSA nosocomial infections developed in 21 patients (6.8%) during the pre-intervention period; therefore, the nosocomial infection rate of MRSA was 8.4 cases per 1000 patient-days. And MRSA nosocomial infections developed in 10 patients (2.6%) during the intervention period; thus, the nosocomial infection rate of MRSA was 3.6 cases per 1000 patient-days ( $p = 0.009$ ).

**Conclusion:** The MRSA bundle approach in the SICU effectively reduced the incidence rate and the nosocomial infection rate of MRSA.

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## **Attempting to Find Clarity in Chaos: A Collaborative Development of the Enteric Outbreak Binder**

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**Issue:** Gastroenteritis can be caused by a wide variety of bacteria and viruses. Outbreaks can impose considerable disruptions to activities and often result in ward closures. Gastroenteritis typically requires a low infectious dose and for this reason often affects both patients and staff. This causes staffing shortages on units thus incurring higher workload volumes due to outbreak measures put in place. The management of outbreaks can change daily often-leaving overburden staff confused and frustrated.

**Project:** Infection Prevention and Control, Public Health, Environmental Services, Volunteer Services, Risk Management, and Nursing staff collaborated to develop an Enteric Outbreak Binder to clarify interventions for suspected and confirmed outbreaks in the hospital setting.

**Results:** The Enteric Outbreak Binder includes nine sections that outline steps to follow during suspected and confirmed outbreaks. The first section provides information on organisms that cause enteric outbreaks such as incubation periods, periods of communicability, transmission and symptom duration. Section two describes the use of routine and additional precautions pertaining to enteric outbreaks. Section three gives case definitions for both suspected and confirmed outbreaks and includes outbreak control measures to be taken under each situation. Specific checklists are incorporated should an outbreak occur over the weekend or if Infection Control cannot be reached. Section four and five deal with communication to staff and patients, families and visitors. Sample signage and memos are included in these sections. Members of an outbreak management team are specified to facilitate clear communication and expectations to various departments during an outbreak. Environmental cleaning requirements are covered in section six, which also includes checklists and information tables for environmental service staff. Educational information provided by Public Health on various organisms that cause enteric outbreaks is covered in section seven. Sections eight and nine include criteria for outbreak resolution and references for the binder.

**Lessons Learned:** The development of Enteric Outbreak Binder required involvement of multiple services, which resulted in the creation of comprehensive outbreak initiatives. The project strengthened relationships between various leadership teams and fostered a united front among the stakeholders.

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## **Sustainable Reduction in Hospital-Acquired Methicillin-Resistant *Staphylococcus aureus* (MRSA) Infections through a Hospital Wide MRSA Screening Program**

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**Issue:** Hospital-acquired MRSA infections can cause devastating results for patients, increased length of stay, and increased cost for the healthcare facility. Our community hospital continued to see a steady increase in the number of hospital-acquired MRSA infections from 2006-2007. In 2007, the state of Pennsylvania passed Act 52, which requires hospitals to screen specific patient populations for MRSA colonization.

**Project:** A hospital wide MRSA Screening Program was developed and implemented, in November 2007, on all nursing units with the exception of Maternity and Pediatrics. Patients are screened upon admission for MRSA colonization. Initially, testing was done using culture; however within a few months the laboratory changed to PCR methodology to increase turn-around time and sensitivity. Any patient that tests positive is placed on contact precautions, in a private room. If private rooms are unavailable, patients are cohorted with other MRSA positive patients. Hospital employees are required to wear gowns and gloves upon entry into a contact precautions room. Compliance with isolation precautions are monitored and reported to staff regularly. A flagging system was created in the hospital's computer system, so that MRSA positive patients can be identified and isolated upon readmission. Educational materials were developed for all patients, explaining the MRSA screening program. An education packet was also created for patients that are MRSA positive. Nursing staff were educated about the screening program and its requirements.

**Results:** The rate of hospital-acquired MRSA infections decreased from 0.70/1,000 patient days in 2007 to 0.36/1,000 patient days in 2008. This rate continued to decrease in 2009 and 2010, with a rate of 0.26/1,000 patient days in 2009 and 0.07/1,000 patient days in 2010.

**Lessons Learned:** A hospital-wide MRSA screening program can contribute to an overall reduction of the rate of hospital-acquired MRSA infection. The success of the program is dependent on compliance with screening policies and isolation precautions. Education for staff and patients are key elements in conveying the importance of the program and its goals.