# OPSI Best Practice Award 2009

The following information provides a brief project description of the OPSI 2009 Best Practice Award recipient and runner-ups. Each applicant provided a description, background on the problem, implementation, results, sustainability, benchmarks, reasons the project is innovative or unique, and barriers with possible solutions. For more information on any of these projects or to request information on other best practices in Ohio, please contact: opsi@ohanet.org

## Winner: The Children's Medical Center of Dayton

*Description – VAP Reduction*

Historically, ventilator-associated pneumonia (VAP) has been considered an unfortunate, but somewhat tolerable, complication of mechanical ventilation. VAP is the second most common healthcare-acquired event occurring in children hospitalized within the pediatric intensive care unit (PICU) environment. Nationally, reported mean pediatric VAP rates range from 2.9-11 per 1000 ventilator days. For the previous 2 years in this PICU, the incidence of VAP was 2 and 6 cases respectively. Prevalence rates were 2.97 and 4.03 per 1000 ventilator days. The estimated added cost of VAP ranges from $5000 to as much as $40,000 per episode. Because of the high morbidity, mortality, and costs associated with VAP, it is an important complication to prevent. In 2007, a multidisciplinary collaborative initiative involving nursing staff, clinical support staff, respiratory therapists, and pediatric intensivists in the PICU sought to significantly decrease the incidence and prevalence of VAP. The goal of the initiative was to reduce the incidence of VAP by at least 50% while doubling the days between VAP occurrences. This project was to occur over the next 12 months.

*Implementation*

After reviewing potential interventions to include in the prevention bundle, specific areas of care were selected. These included:

- Head of bed elevation to 30 degrees
- Oral care using 2.5% chlorhexidine oral rinse for patients over age 2 months
- Mouth/hypopharyngeal suctioning
- Ventilator tubing drainage
- Daily discussion about the patient's readiness to wean or extubate
- Suction line rinsed after each use
- Daily change of the suction canister and Yaunker catheter

Education was provided to the nursing staff, clinical support staff, respiratory care staff, and intensivists, and included information on VAP and the specific targeted areas of care. In order to

measure compliance with the bundle interventions, a compliance-monitoring tool was created. The patient's nurse and the respiratory therapist each independently completed a tool every 12 hours. Data were tabulated monthly and the average compliance with each intervention and the bundle as a whole were calculated. As part of the usual PICU quality-monitoring program, data were collected on the incidence and prevalence of VAP.

*Results / Sustainability*

After implementation of the care bundle, the incidence of VAP in the PICU went from a baseline of 5 cases the previous fiscal year to zero for over 21 months, well exceeding the goal of decreasing the incidence of VAP by 50%. In 2007, 2008, and the first quarter of 2009, only 1 case of VAP has occurred in the PICU. At its peak, the PICU went 623 days between VAP occurrences.

## Runner-up: The Ohio State University Medical Center

*Description – MRSA Reduction*

Increasing antibiotic resistance among the most common bacterial pathogens, in the hospital and community, presents a growing threat to human health worldwide. There is increased morbidity, mortality, length of stay, and hospital costs associated with these infections compared to the infections caused by the more susceptible organisms. Hospitals currently are to get very little, if any, reimbursement for hospital acquired infections (HAIs). Recent financial data support the extremely conservative estimate that the costs for the 4% of patients who develop HAIs can consume up to 185% of a hospital's operating profits.

The goal of this program is implementation of a novel, innovative, multifaceted patient safety program to reduce healthcare transmission of MRSA in an attempt to keep our patients safe from the healthcare acquired infections due to MRSA. This program promotes staff nurses (RNs) and clinical nurse educators (CNEs) as liaisons to the infection control (IC) professionals on the patient care units (PCUs). These liaisons are called Link Nurses. They advocated compliance with hand hygiene and contact isolation among health care workers. Healthcare acquired MRSA rate is monitored to assess the effect of the Link Nurse Program. This is a multidisciplinary program that involved Department of Clinical Epidemiology, Department of Nursing and Department of Clinical Microbiology. We hypothesize that by having dedicated staff nurses on the individual patient care units who act as advocates for hand hygiene and contact isolation and providing units with ongoing feedback of unit specific hospital acquired infection rates, along with hand hygiene and contact isolation performance metrics would reduce hospital transmission of MRSA.

*Implementation*

Chief nursing officers for the respective hospitals within the health system were individually approached with their respective infection rates to apprise them of the program and the time commitment for the Link Nurse Program; enthusiastic support was obtained. RNs and CNEs

volunteered or were chosen to become link nurses (LNs). A 2 day (16 hour) curriculum was created by the IC professionals to include: basic principles of IC, multi-drug resistant organisms (MDRO), isolation processes, interpretation of microbiologic data and ways to recognize/control an outbreak for the initial training session. Two-16 hour sessions were initially planned; followed by monthly meetings to reinforce individual aspects of the LN curriculum. HA-MRSA (defined as MRSA cultured on or after day 4 of an in-hospital admission in a patient without a previous positive MRSA culture) was used as the performance indicator for each patient care unit. HA-MRSA data was compiled on a system-wide and unit specific basis for calendar years (CY) 2006, 2007 and 2008 from the IC database. HA-MRSA unit specific rates, along with unit specific monthly HH and CI compliance are shared with LNs during monthly meetings. LNs are to share MRSA, HH and CI PCU data with their hospital staff.

*Results / Sustainability*

When monthly MRSA rates were compared, the units with link nurses trained in April'08 showed a decreasing trend in monthly rates of HA-MRSA in 2nd quarter'08; non-link nurse units showed a flat trend line. Overall, Health-system MRSA decreased from 1.00 per 1000 patient days (PD) in January'08 to 0.59/1000PD in June'08. Hand hygiene compliance has increased from 72% to 93% from April through June 2008. The first link nurse training session was conducted in April 2008. We have exceeded our goals for both reducing healthcare acquired MRSA and improvement in hand hygiene compliance.

## **Runner-up**: **The Children's Medical Center of Dayton**

*Description – Blood Culture Contamination*

Blood culture contamination rates for specific departments, including emergency services and outpatient areas, have been routinely tracked on a monthly basis. In fiscal year 2000, we noted an increase in the contamination rate to a high of about 7% in the Emergency Department. We experienced an increased rate of contamination during FY 2006, to as high as 4.9% for phlebotomists in the laboratory. Thus, we expanded the project to examine the causative factors for this group as well. Contaminates can result in unnecessary admissions of a child, unnecessary antibiotic administration, expensive revaluations of patients, and the potential for a hospital acquired infection exposure due to admission. This organization's laboratory participates in Q-Tracks and had determined that our rate was 3.3% house-wide for fiscal year 2000-2001 (July '00 to June '01), which was above the median for all institutions. Bates et. al. (1991) reported that the average inpatient with a contaminated blood culture accumulated $4385 in excess charges and can result in bed utilization issues as well.

Our goals:

- Statistically reduce the blood culture contamination rate
- Prevent unnecessary admissions

- Assure appropriate patient management
- Develop proven standardized practices for drawing blood specimens

Improvement goals:

- To decrease the number of confirmed blood culture contaminants by a statistically significant amount and sustain a low rate by June 2008
- To strive to reach "0" contaminants in both the Emergency Department and the Clinical Laboratory by June of 2008
- To eliminate the unnecessary occupancy of inpatient or observation bed space that could be used by other patients by assuring that the blood culture result is not contaminated. (December 2005)
- To standardize the blood culture collection process using evidence based practices by October 2002 in the Emergency Department (pilot unit)
- To standardize the blood culture collection process using evidence based practices by January 2006 in the Clinical Laboratory.

*Implementation*

We attempted an educational initiative with Emergency Department staff that focused on technique for the blood culture draw and aseptic skin preparation initially. All nurses and physicians reviewed the changes. Results of this effort were mixed, with the team reducing the rates periodically, but never reaching "0". Staff did not want to cause pain through a separate stick and the IV line at the time of insertion, remained the source of the blood draw. The turning point in this project was truly the decision in August 2002 to require staff to do a separate stick when drawing a blood culture using chlorhexidine as the skin prep. This was coupled with the assignment of tech codes by the LIS so that the lab personnel could notify the E.D. manager of who had a contaminated specimen. The intent has not been to chastise that individual, but counsel and mentor the staff person involved to do the correct procedure in the future. Reward, recognition and active ongoing education / intervention have also been added since this point. All have made a difference in the Emergency Department. The laboratory utilized the Laboratory Information System to create tech codes for each nurse or physician who is collecting specimens in the E.D. This has allowed us to link the individual involved with the Sunquest test result for follow-up counseling and mentoring. It has also allowed timely follow-up from the lab personnel to the E.D. so that the problems can be addressed quickly. *Recommendations to use chlorhexidine were made by the Centers for Disease control and have proven to be far superior to the use of alcohol or betadine.

*Results / Sustainability*

When comparing fiscal year 2000-2001 to fiscal year 2007-2008, our overall mean blood culture contamination rate has decreased from 3.3% to 1.4%. For an average of 7130 patients per year on whom blood cultures are drawn, the number of patients with a contaminated blood culture was reduced from 236 to 103. That's 133 patients a year who are spared repeat visits, admissions or prolonged stays, excess charges, and the potential of a hospital acquired infection by being admitted unnecessarily. The Emergency Department and overall organizational impact has been statistically significant, in large portion to the cultural shift that has occurred. The lab routinely calls the ED if there is a contaminant and the manager will discuss with the personnel involved. The personnel in the ED are passionate about reducing the need for repeat testing and pain for the patient. The offsite diagnostic centers have had many months with no contaminants as well. The following is an overall summary of the outcomes of the project:

- Standardized the process for drawing blood cultures across the organization, including use of chlorhexidine as the skin prep.
- Achieved a statistically significant level of $p < 0.001$ reduction in the contamination rate of blood cultures in the Emergency Department
- Reduced the contamination rate to a statistically significant level of $p<0.001$ and to a level that is below the 10th percentile of all participating Q-Track hospitals per the Clinical Association of Pathologists report organization-wide. The rate as of September 2008 was 0.93 compared to the lowest 10th percentile rate of 1.16
- Demonstrated, based upon a study by Bekeris et al. in 2004, which reported that a contaminated specimen results in incremental expenses to a patient of up to $5506 extra costs per patient (and not updated to today's rate), that an estimated 133 patients per year since October 2002 may have avoided extra testing, extended lengths of stay, or avoided/ limited further outpatient evaluation. We cannot specifically quantify this organization's savings due to variations in patient conditions
- Heightened cultural sensitivity of the organization to the need for sustained active engagement and passion for performance improvement on an ongoing basis to maintain the gain.