Project Submission:
2009 Delaware Valley Patient Safety Award

MERCY PHILADELPHIA HOSPITAL

"Reduction in Infection Rates by Improved Hand Hygiene Compliance"

THE HEALTH CARE IMPROVEMENT FOUNDATION
Building Partnerships For Better Health Care

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2009 Delaware Valley Patient Safety Award

Title: Reduction in Infection Rates by Improved Hand Hygiene Compliance

Abstract: Nationwide less than 50% of healthcare workers sanitize their hands (CDC, 2002). Studies have demonstrated that the acquisition of various health-care-associated pathogens was reduced when hand antisepsis was performed more frequently by hospital personnel (Pittet et al, 2000). Documentation of the prevalence of Healthcare Associated Infections (HAIs) decreased as adherence to recommended hand-hygiene measures improved (Larson et al. 2000). Our hospital was no exception. In order to improve hand hygiene compliance, a multifaceted approach following published guidelines was initiated. From third quarter 2008 to second quarter 2009, compliance rose from a 48% to 70.2% and HAIs demonstrated a sharp decline throughout the hospital. Infection rates for the hospital in the second quarter of 2009 were as follows: one central line associated blood stream infection; no incidence of ventilator associated pneumonia; and, no catheter associated urinary tract infections.

Goals:

- Improve hand hygiene compliance resulting in a concomitant reduction in central line associated blood stream infections (CL-BSI), ventilator associated pneumonia (VAP), & catheter associated urinary tract infections (CA-UTI) infection rates.

Baseline Data:
Process and outcome data were used to measure hand hygiene compliance.

- National Healthcare Safety Network (NHSN) Infection Rates-Outcome Data

Our hospital is a tier III community hospital with less than 200 beds. Based on the NHSN data summary report (Edwards et al, 2008) the hospital is a non-major teaching hospital and infection rate means were compared to this group. This hospital has one medical/surgical ICU, one adult step-down unit, one medical/surgical unit, and 3 medical units. Device associated infections are reported to NHSN, namely CL-BSI, VAP, and CA-UTI. Rates of infection were calculated per unit and compared to their respective national average counterpart. See (Figure I)

- Hand Hygiene Compliance Rates-Process Data

Each unit manager submits 20 hand hygiene observations per month. We also have non-unit based managers or their designees making observations throughout the hospital. This includes departments such as dietary, patient relations, security, environmental services, and laboratory services. All data is compiled by unit of observation and healthcare worker type. Compliance is defined as an observation either of hand washing with soap and water or utilizing a waterless alcohol based hand rub. Initially the hand hygiene data was distributed quarterly. It was determined that this was not sensitive enough to show changes in hand hygiene compliance so the data was compiled and distributed monthly to all departments to share with their employees.

Interventions:
The intervention period consisted of data collection over approximately an 8 month period. By the end of first quarter of 2009, all interventions were refined and in place.

- Education
  - New Employee Orientation

Part of the new employee orientation focuses on hand hygiene and how the hospital environment was different from the home. Both compliance and competency were initiated at the orientations. Employees were encouraged to help the hospital achieve 100% compliance by reminding their colleagues if they forgot without fear of reprisals. Education was also provided to new residents during their orientation.

  - Patient Safety Fair

The Infection Prevention & Control department was part of the Patient Safety Fair held May of 2009. The fair was scheduled to accommodate all staff on all shifts. Hand hygiene was stressed and compliance data shown to all employees. Employees were encouraged to help the hospital achieve 100% compliance by reminding their colleagues if they forgot. Approximately 90% of employees were live participants; the remaining employees were given information packets and direct in-service by their managers.

  - Department-Based In-Service

At the request of departmental managers, in-service opportunities were conducted. Employees were encouraged to directly assist the hospital in achieving 100% compliance by serving as examples themselves and reminding their colleagues to sanitize their hands. This activity was expected to be conducted in a non-punitive manner without fear of reprisals.

  - Point of Care Intervention and Observation

Infection Prevention & Control department makes daily isolation rounds. Verbal reminders were given directly to employees if they forgot to sanitize their hands. Likewise, a public acknowledgement (thank you) was given when employees were observed sanitizing hands. Non-compliant employees were educated about hand hygiene. Additionally, Administration (Chief Medical Officer and Hospital Infection Preventionist Manager) conducted unannounced rounds on all shifts and also promoted hand hygiene.

- Rounding With Multidisciplinary Members

Rounding is critical to improvement of hand hygiene. All members of the multidisciplinary team also act as role models for hand hygiene and insure that they take every opportunity possible to demonstrate hand hygiene compliance while making rounds.

  - Environment of Care Committee (EOC)

The EOC committee rounds the hospital weekly to insure that all Joint Commission requirements are met. As part of the rounds, a short question and answer session is done with the available employees. Hand hygiene is also part of the rounds including encouragement of all employees to remind others who are not compliant.

  - Infectious Disease MD, Pharmacy, Infection Prevention and Control Rounds

This group makes rounds together every 4-6 weeks. They take the opportunity to educate and serve as role models for hand hygiene compliance. Their role model status continues when they are conducting their individual duties.

- Focused Multidisciplinary Team Meetings

Two infection prevention and control teams exist in the hospital. The stakeholders represent a multitude of disciplines and departments.

  - Infection Prevention and Control Committee

This multidisciplinary team focuses on all the aspects of in the hospital. Hand hygiene is routinely discussed. Suggestions on improvement are made. Changes are taken back to the various departments.

- Infection Control Events (ICE) Team

This team has a more clinical focus and drills down on specific types of infections such as CL-BSI or hospital acquired *Clostridium difficile* infections. Members of the team were multidisciplinary and multilevel to encompass all areas of care provision. Some members of the team are highly experienced and in charge of various care provider disciplines. Meetings identify the underlying issues (epidemiology of infection) causing a specific infection. Action plans are developed and members take the plans back to their disciplines for education and implementation.

- Intensified Placement of Hand Hygiene Dispensers

Point of care waterless hand sanitizer units were initially placed July 2008 with installations essentially complete as of September 2008. Requests for unit placements are coordinated by the Infection Prevention and Control department. A sticker with the telephone extension to call for refills is applied to each unit.

- Identify Stakeholders in Process to Hold Accountable

All managers receive a monthly "scorecard" illustrating their employees' hand hygiene compliance. Colleague accountability receives the strong support of hospital administration. The Chief Medical Officer and VP of Clinical Services among others are directly involved and provide a moving force toward the hospital's infection reduction goals. Leadership does not hesitate to discuss the importance of hand hygiene with health care workers who have not joined the march to defeat HAIs.

- Identify & Expand Collection Methods

  We have created a robust hand hygiene program (Figure 3). To minimize bias, we have non-unit based managers or their designees making observations throughout the hospital as well as unit-based observations. A reminder is sent via email on the last day of the month and includes a copy of the hand hygiene collection tool. The email also contains an excel-based table listing all groups that submit data and who has submitted data so far for the current month. This is sent to all managers collecting data. They have 5 business days from the end of the month to submit the data. Late data is not accepted. After the deadline, the updated compliance table is automatically sent to the CEO of the hospital who has the option to discuss lack of participation with the non-compliant department.

- Feedback Methods- Monthly Score card (Red/Yellow/Green Indicators)

All data is compiled by unit and by healthcare worker type into a score card. Colors are assigned to percentage compliance (Figure 4).

Green color is assigned for $\geq$ 90% compliance.
Yellow color is assigned to $\geq$ 75% < 90%.
Red is assigned for less than 75% compliance.

This is done for several reasons. Firstly, we have only been collecting the data for less than a year and do not have enough information to be confident of the standard deviation. Secondly, in order to effect culture change, we did not want to create a false sense of improvement by having various employees see increases in compliance that could still be meaningless.

Results:

- Behavior Change (Culture)

The ultimate goal of the program is to create automatic behavior and make hand hygiene the routine standard practice. While this is a requirement of Joint Commission, we want to heighten awareness until this is a natural behavior reflected by 100% compliance. In the process of developing and instituting this program several observations were apparent.

- Facility role models became evident

Our program had early adopters. These were our role models. We continue to engage additional individuals throughout the hospital from every department.

- All hands are created equal

All employees are considered health care workers even if they do not directly work with patients. Each hand is given equal importance and no hierarchy is created.

- Visible positive feedback

Acknowledging individuals with a public "thank you" is important. We focused on the positive rather than the negative and communicated our successes. While education and spot reminders / explanations are still a part of the program, more opportunities to thank people have arisen as positive behavior changes became apparent.

- Group think/pressure/competitiveness

By their nature, the majority of health care workers are highly competitive. When departments or specific types of health care workers were "in the red" this generated numerous discussions with Infection Prevention and Control. Managers sought advice as well as individuals within affected departments. Managers and individuals were encouraged to develop a team approach to help remind their peers and others of the importance of hand hygiene. They were encouraged to report any negative push-back to the Infection Prevention and Control Department.

- Opportunity to Raise the Bar

As more data is collected and we have more confidence in the statistical power of our numbers, the scorecard will be revised so that "green" will require a score of >95% with yellow and red revised accordingly.

- Reduction in infection rates by hospital department
  Figures 1 and 2 illustrate reduction in HAIs.
- Hand Hygiene compliance rates
  Hand hygiene compliance was measured as a percentage of opportunities. Hand hygiene data collection was initiated 4th quarter of 2008 in areas of the hospital where the general public were also present (Figure 3). Data was also disseminated in the form of a score card (Figure 4).

How this initiative may be replicated throughout the region:

- Enlist administrative support and participation
- Assemble a team of committed stakeholders and develop a plan
- Provide proper hand sanitizing equipment and a process for maintenance and replenishment of supplies.
- Identify departmental peer role models & encourage their behavior; use constant and consistent application of reminders; provide positive recognition of compliant behavior
- Collect and Analyze Data
- Provide Feedback of Results to foster continuous improvement.
- Celebrate Individual and Departmental Successes

References:

CDC Recommendations & Reports. Guideline for Hand Hygiene in health-Care Settings. MMWR 2002;51:RR-16

Edwards JR, Peterson KD, Andrus ML, Dudeck MA, Pollock DA, Horan TC, NHSN Facilities. National Healthcare Safety Network (NHSN) Report, data summary for 2006 through 2007, issued November 2008. Am J Infect Control 2008;36:609-26

Larson EL, Early E, Cloonan P, Sugrue S, Parides M. An organizational climate intervention associated with increased handwashing and decreased nosocomial infections. Behav Med 2000;26:4-22

Pittet D, Hugonnet S, Harbarth S, Mourouga P, Sauvan V, Touveneau S. Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. Lancet 2000;356:307-12.

Appendices:

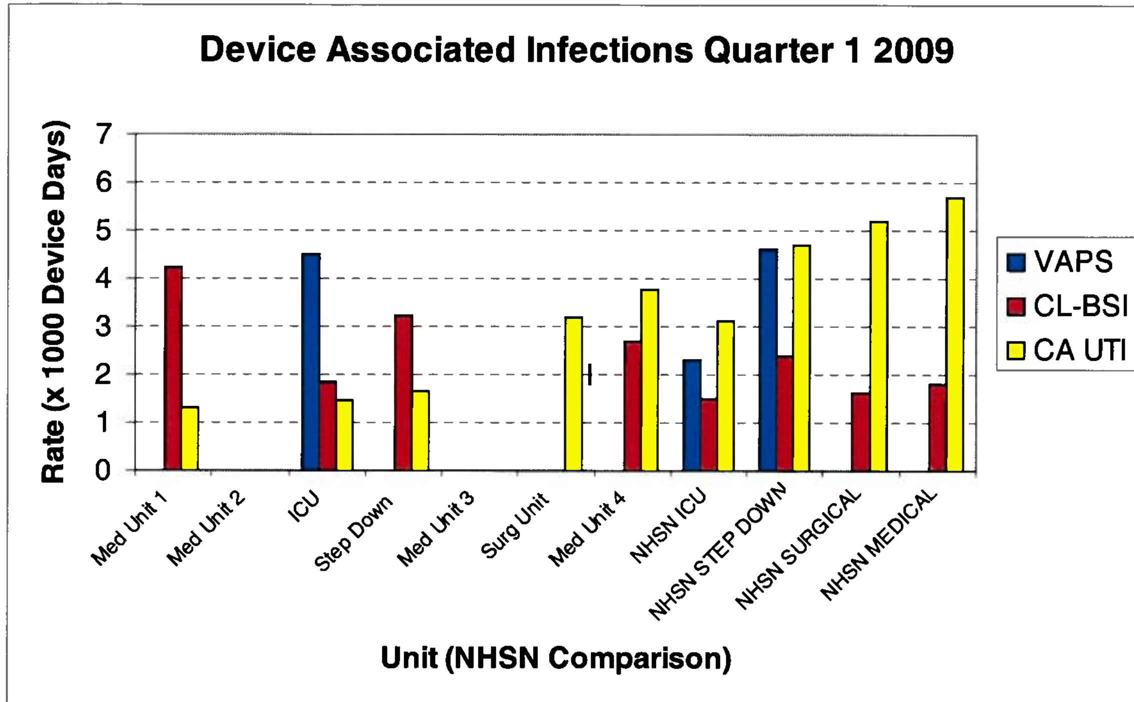


Figure 1. Device-associated infection rates for first quarter. VAPs, CL-BSI and CA-UTI were collected for the hospital and compared to their NHSN counterparts.

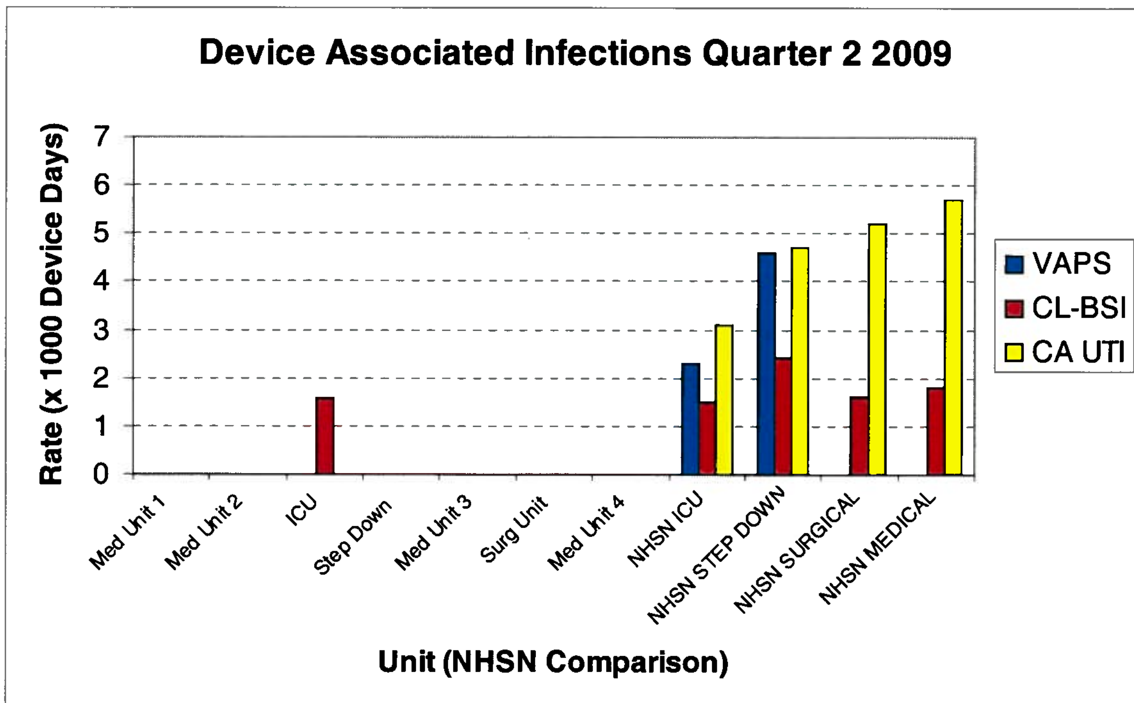


Figure 2. Device-associated infection rates for second quarter. VAPs, CL-BSI and CA-UTI were collected for the hospital and compared to their NHSN counterparts.

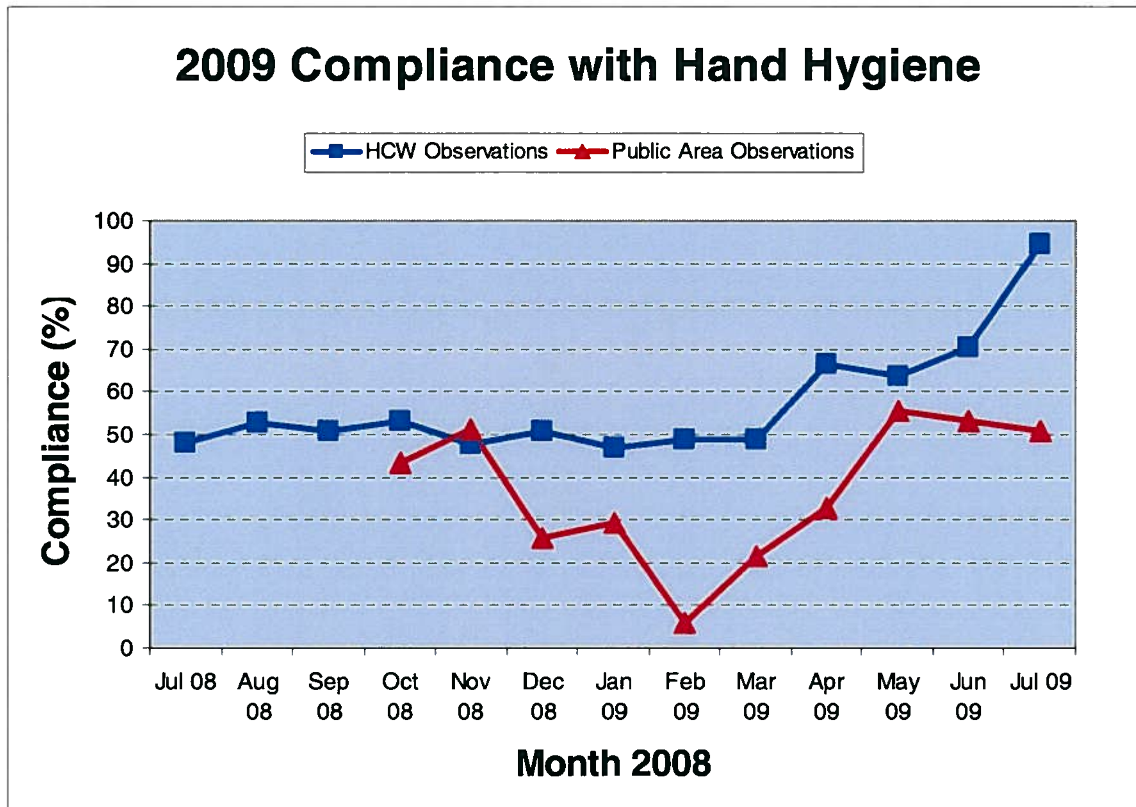
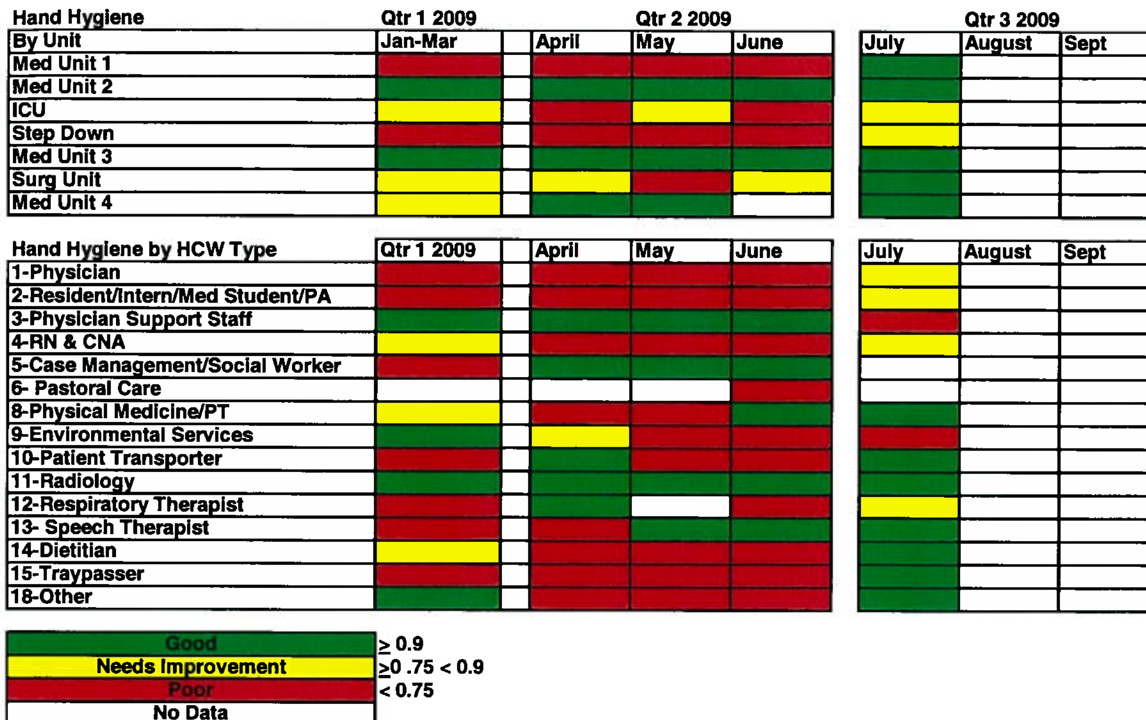


Figure 3. Compliance with hand hygiene. Data was collected since July 2008 and plotted over time. All interventions for hand hygiene compliance were in place by first quarter 2009. Data was also collected in areas of the hospital where the general public congregated.



Hand Hygiene	Qtr 1 2009		Qtr 2 2009			Qtr 3 2009		
By Unit	Jan-Mar		April	May	June	July	August	Sept
Med Unit 1								
Med Unit 2								
ICU								
Step Down								
Med Unit 3								
Surg Unit								
Med Unit 4								

Hand Hygiene by HCW Type	Qtr 1 2009		April	May	June	July	August	Sept
1-Physician								
2-Resident/Intern/Med Student/PA								
3-Physician Support Staff								
4-RN & CNA								
5-Case Management/Social Worker								
6- Pastoral Care								
8-Physical Medicine/PT								
9-Environmental Services								
10-Patient Transporter								
11-Radiology								
12-Respiratory Therapist								
13- Speech Therapist								
14-Dietitian								
15-Traypasser								
18-Other								

Legend	Range
Good	≥ 0.9
Needs Improvement	≥0 .75 < 0.9
Poor	< 0.75
No Data	

Figure 4. The scorecard was modified to disseminate data monthly not quarterly. The data gives the individual HCW type and units direction & incentive for improvement.