

Page Rehabilitation and Health Center Combines Technology, Best Practices to Improve Infection Control

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ABSTRACT

Healthcare-acquired infections (HAIs) affect nearly 2 million people and add billions of dollars to healthcare costs in the U.S. every year. *The Centers for Disease Control and Prevention estimates that the \$45 billion annual direct cost of HAIs could be significantly reduced by as much as \$31.5 billion by implementing effective infection prevention and control programs.* As viruses and bacteria grow increasingly resistant to traditional medicines and infection control best practices, health care facility administrators are examining technology solutions to supplement their infection control programs. This article examines the results of a two-year study conducted at Page Rehabilitation and Healthcare Center (PRHC) that compares nosocomial (facility acquired) infection rates before and after the implementation of the Novaerus infection control technology. The resulting reductions in infection rates for nosocomial infections demonstrate that other facilities can use PRHC as a model of how to effectively combine best practices with technology to reduce the likelihood of an HAI outbreak.

INTRODUCTION

Healthcare-acquired infections (HAIs) represent a significant and growing threat. HAIs account for 4.5 infections for every 100 hospital admissions, and 1.8 million people per year acquire an infection during their hospital stays. Hospital patients with a positive clinical culture for methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci or *Clostridium difficile* are 40 percent likelier to be readmitted within a year than other patients, according to a study in the June 2012 issue of *Infection Control and Hospital Epidemiology*. About 20 percent of Medicare patients are readmitted within a month, costing \$17.4 billion annually, according to an April 2, 2009, study in *The New England Journal of Medicine*.

The Centers for Disease Control and Prevention (CDC) March 2009 report on the direct medical costs of HAIs estimates that \$35.7 to \$45 billion in 2007 dollars is added to the nation's annual healthcare costs to treat these infections. These estimates demonstrate the necessity of an effective HAI prevention program.

The challenge to maintaining that effectiveness is antimicrobial resistance (AMR), which refers to the resistance of a microorganism to an antimicrobial medicine to which it was previously sensitive. Resistant organisms (e.g., bacteria, viruses and some parasites) are able to withstand attack by antimicrobial medicines, such as antibiotics, antivirals, and antimalarials, so that standard treatments become ineffective and infections persist and may spread to others. More than 70 percent of bacteria that cause HAIs are resistant to at least one of the drugs

most commonly used to treat them.

CASE STUDY

Based in Ft. Myers, Fla., Page Rehabilitation and Healthcare Center (PRHC) provides short and long-term rehabilitation and skilled nursing services, and a 44-bed special care unit for residents with Alzheimers disease and other memory related disorders.

PRHC implemented the Novaerus systems in October 2012.

METHODOLOGY

A twenty four-month review was performed on PRHC to evaluate the results that the CEO stated that his facility had benefitted from. A Nurse Risk Manager Consultant visited the facility for two days to pull the facility information and to review the following data:

- Admission, transfer, and discharge data for all residents,
- Monthly infection control records, reports, and surveillance, and
- Individual resident infection control examination results (x-rays, cultures, etc.).

Subsequent to review of this data, documentation for certain periods from 2011 and 2012 was not available; however, data for the periods of June-September of 2012 (prior to facility implementation of Novaerus) as well as all documentation from January through September of 2013 appear meticulous and reliable. The period selected for this study compares the June-September quarters of

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2012 and 2013. Comparison of like periods in both years reduces the risk of skewed data related to seasonal variances that might occur with infection rates.

First, this study tallies and compares the total number of nosocomial infections of all etiologies (e.g. respiratory, wound, urinary tract, etc.) for the aforementioned periods. Next, the study tallies and compares the total number of nosocomial infections with respiratory etiologies specifically for the aforementioned periods. Lastly, the study compares the ratio of nosocomial respiratory infections to nosocomial infections of all other etiologies for the aforementioned periods.

RETURN ON INVESTMENT

As indicated on the attached graphs, the infection rates for nosocomial infections with all etiologies reduced significantly by 56percent on average subsequent to implementation of the Novaerus system for the aforementioned periods. Additionally, the infection rates for nosocomial infections of respiratory etiologies reduced

significantly by 75percent on average subsequent to implementation of the Novaerus system for the aforementioned periods. Further, the ratio of nosocomial infections with respiratory etiologies to other etiologies reduced significantly, from 37percent to 20percent on average subsequent to implementation of the Novaerus system for the aforementioned periods.

CONCLUSION AND ADDITIONAL RESEARCH

The reduction in infection rates following the implementation of the Novaerus systems provides promising data for the long-term effectiveness of PHRC's infection control program.

One recommendation for follow up study might be to incorporate the above findings with facility census data to demonstrate that measurable improvements remained consistent relative to the total facility census. A second recommendation for follow up study might be to assess whether the return to hospital rate improved significantly subsequent to implementation of the Novaerus system.

NOVAERUS STUDY FOR PAGE REHAB COMPARISON OF NOSOCOMIAL INFECTION RATES FOR THE JUNE-SEPTEMBER PERIOD - 2012 VS. 2013

