Edgehill Nursing and Rehabilitation Center (ENRC), a 60-bed skilled nursing facility located in Glenside, PA, implemented the Novaerus healthy air technology system in July 2014. This technology reduces chance of infection by minimizing airborne pathogens and volatile organic compounds (VOCs) including; Norovirus, influenza, Clostridium difficile, MRSA, mold spores and odors. This study examines the results of a two-year study conducted at ENRC and compares nosocomial (facility-acquired) infection rates of respiratory etiology before and after the implementation of the Novaerus technology. The resulting reductions in infection rates demonstrate the efficacy of Novaerus technology in the long term care setting.

**ABSTRACT**

Edgehill Nursing and Rehabilitation Center Experiences Significant Reduction in Nosocomial Infections of Respiratory Etiology by Implementing Novaerus Technology.

**BACKGROUND**

Nosocomial infections continue to be a burden to the long term care (LTC) community through increased risks to residents and employees. These infections have tremendous health and financial costs with millions of infections per year. Effective infection control programs are essential to controlling and preventing nosocomial infections.

Infectious diseases have become a more prominent area of concern in long term care facilities in recent years. *Clostridium difficile*, Norovirus, multi-drug resistant organisms (MDROs) and influenza have all presented difficulties for LTC facility staff, especially mitigating the spread of these pathogens and the illness they cause. Thus, infection control and proactive infection prevention methods are now crucial in LTC facilities.

A study from Columbia University School of Nursing found that skilled nursing facility infection rates are on the rise, suggesting that more must be done to protect residents of these facilities from harmful pathogens. The study, which examined infections in nursing homes in the United States over a five-year period, found increased infection rates for pneumonia and MDROs. Infections are a leading cause of death and complications for nursing home residents. Unless infection prevention and control methods are implemented, this problem is only going to get worse.

LTC facilities provide a variety of medical and non-medical services to people who have a chronic disease or disability. An increasing number of individuals in the United States are receiving care in LTC facilities. These residents have growing medical complexity and care needs due to an increasing exposure to devices and antibiotics. Pneumonia and other infections can easily spread through the air, thus, cleaning the air is essential for prevention. Residents, visitors, and staff should all have the benefit of a safe and healthy environment when in these LTC settings.

**METHODS**

A 24-month review was performed on Edgehill Nursing and Rehabilitation Center to evaluate the results that the CEO stated his facility experienced. 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
- Individual resident infection control examination results (x-rays, cultures, etc.)
- A map of the facility, which displays selected areas where the Novaerus system was implemented

The period selected for the study compares the data between August 2013 thru April 2014, prior to Novaerus implementation, and August 2014 thru April 2015, after Novaerus implementation. Comparison of like periods pre- and post-implementation reduces the risk of skewed data related to seasonal variances that might occur with infection rates. The study tallies and compares the nosocomial infection occurrences related to respiratory etiologies pre- and post-implementation of the Novaerus technology.
RESULTS

Prior to implementation of Novaerus technology, the facility sum total of nosocomial infections related to respiratory etiologies tallied 30. In the period after Novaerus implementation, the facility sum total of nosocomial infections related to respiratory etiologies in Novaerus installed rooms tallied 19, which is a decline of 36%. Implementation of the Novaerus technology has contributed significantly to the infection control, as well as quality improvement efforts at Edgehill Nursing and Rehabilitation Center. The attached graph illustrates this comparison.

CONCLUSIONS

Implementation of the Novaerus technology has contributed significantly to the infection control, as well as quality improvement efforts at Edgehill Nursing and Rehabilitation Center. Reducing the chance of airborne infection has proven advantageous both clinically and financially for ENRC. The reduction in nosocomial infections of respiratory etiologies will continue to improve the quality of life for the residents and staff. The implementation of the Novaerus system was the only quality improvement method that was effectuated during this time. Thus, the reduction in infections is most likely attributed to the Novaerus technology.

DISCUSSION

Airborne transmission has become an increasingly serious issue. When an infected person sheds viruses through coughing or sneezing into the air, the mucus coating on the virus starts to evaporate. Once this mucus evaporates, the remaining viron is called a droplet nucleus. These particles are highly infectious and can survive indefinitely in the air. Bacteria also exhibit similar mechanisms, including the formation of endospores such as those produced by Clostridium difficile. This highlights the need for Novaerus technology, combined with appropriate antibiotics usage and monitoring of infections. Resistant organisms are not able to withstand the effect of the Novaerus technology, which results in such significant infection rate declines, as seen in this study.

The study uses the total number of respiratory infections during the course of 12 months pre- and post-implementation to compare the rate of infections at Edgehill Nursing and Rehabilitation Center. ENRC uses best practices in combination with Novaerus healthy air technology to ensure that their residents are protected from infections.