

Project Submission:
2009 Delaware Valley Patient Safety Award

HOLY REDEEMER HOSPITAL

“Preventing Ventilator-Associated Pneumonia”

Abstract

Our organization looked at the ventilator bundle as an opportunity to improve quality and as a best practice to improve our processes and systems. The Institute for Healthcare Improvement stated that the application of the ventilator bundle could clearly reduce the incidence of ventilator associated pneumonia. The implementation of the ventilator bundle was a way to achieve quality by providing safe, efficient, and effective care for our patients. Our team decided to participate in the VHA Transformation of the ICU program. This was a collaborative program with VHA to use evidence-based practices to reduce the incidence of ventilator-associated pneumonia in mechanically ventilated patients. This initiative has made a significant contribution to patient safety in our organization. The initiative has also had an impact on cost by reducing the length of time a patient is mechanically ventilated and overall length of stay for patients requiring mechanical ventilation. We have demonstrated leadership, organizational commitment, and sustainability. These strategies can be replicated at any organization to improve patient safety.

Title

Prevention of Ventilator Associated Pneumonia

Goals

The goal we established was to reduce ventilator-associated pneumonia, decrease days on the ventilator, and decrease length of stay in the intensive care unit.

Baseline Data

Our baseline data from 2004 offered some room for improvement in the number of ventilator-associated pneumonia and an opportunity to decrease the amount of ventilator days.

Interventions

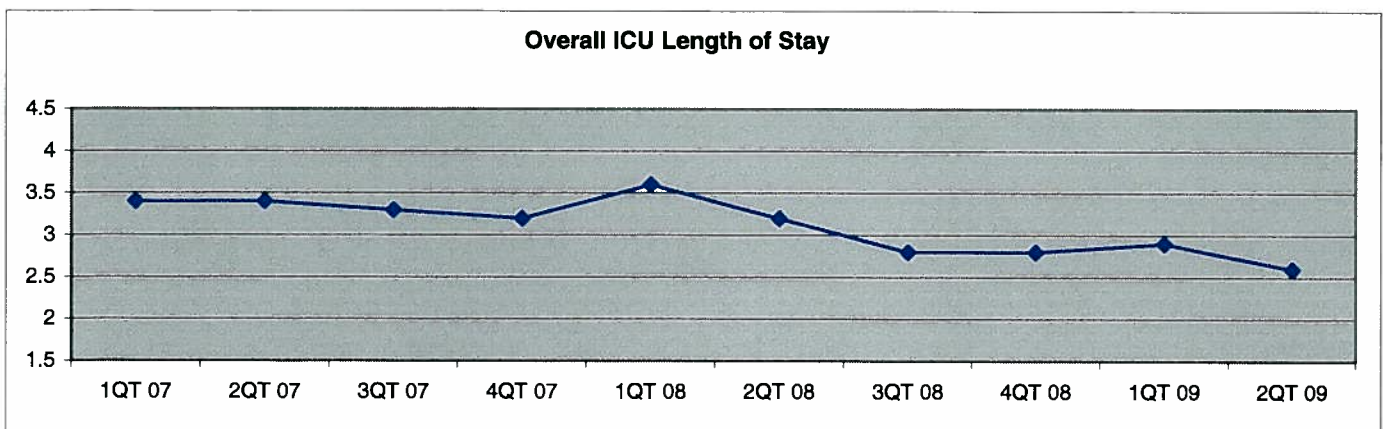
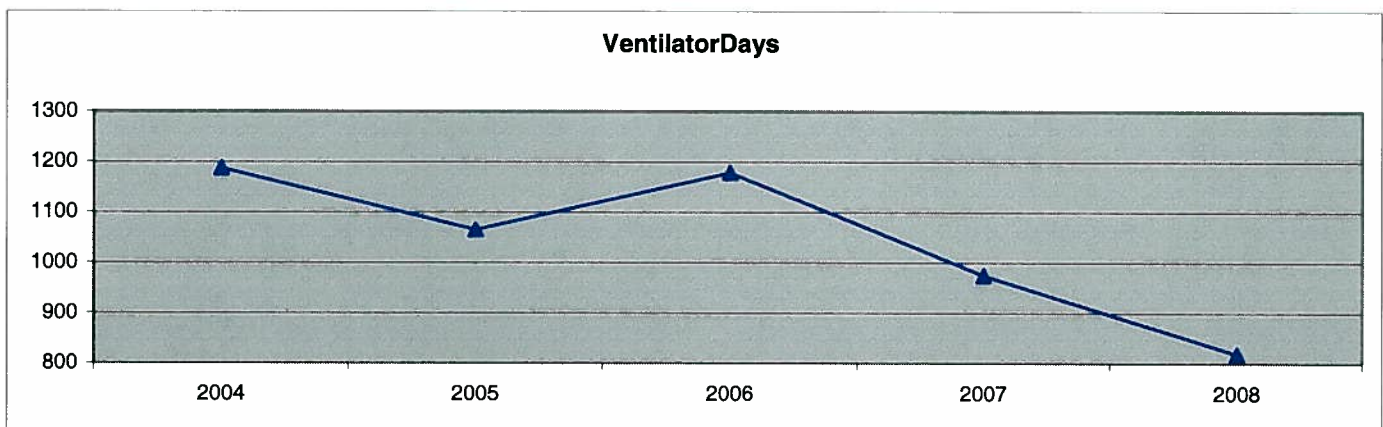
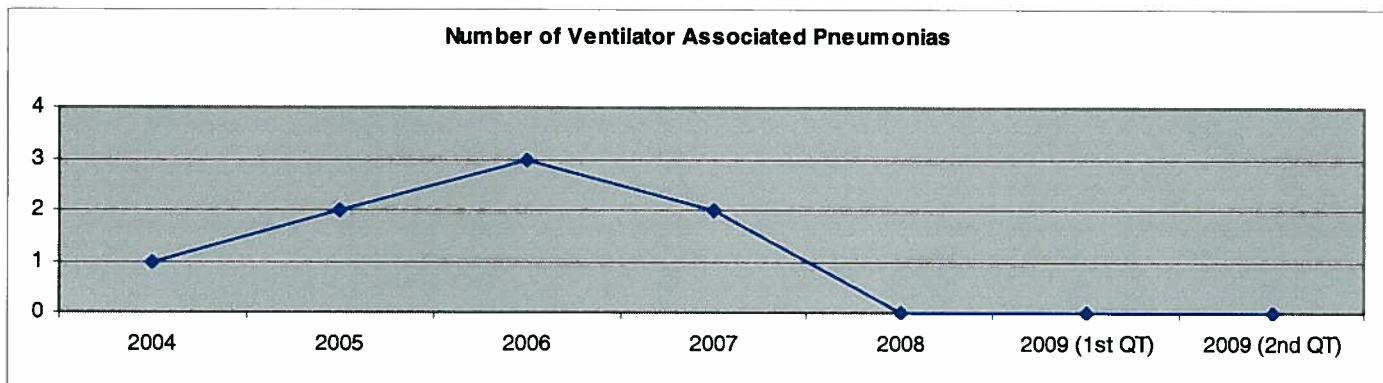
A commitment was made to improve the delivery of care in our intensive care unit. A multidisciplinary team was formed to participate in the implementation of the ventilator bundle. The Intensive care staff was educated through staff meetings and unit specific in-services on the principles behind elevation of the head of bed, daily assessment of readiness to extubate, peptic ulcer disease prophylaxis, and deep vein thrombosis prophylaxis. This was accomplished by incorporating the indicators into our daily multidisciplinary rounds

Steps taken:

- Instituted the Ventilator Bundle and monitor the interventions.
- Patient position: The hospital staff checks head of bed elevation during daily rounds and every time there is patient/care-giver interaction.
- Daily sedation vacation and daily assessment of readiness to extubate: Members of the ICU medical, nursing and respiratory staff evaluate the patient on a daily basis.
- Peptic ulcer disease prophylaxis: Patients on ventilators receive IV antacids as long as they remain on the vent, unless contraindicated.
- Deep vein thrombosis (DVT) prophylaxis: Patients on ventilators receive a blood thinner, either by IV or injection as long as they remain on the vent, unless contraindicated.
- Additional steps that have also been instituted to prevent development of VAP include aggressive suctioning of oropharyngeal secretions, oral cleanings every 2 hours to prevent bacteria from collecting in the mouth, and intensivist coverage 24 hours a day.

Results

Our results have demonstrated a sustained decrease in the rate of ventilator associated pneumonia as well as a decrease in the overall number of ventilator days. In 2008, and thus far in 2009, we have had zero ventilator associated pneumonia cases and we have decreased our ventilator days for 2008 to 819, representing a 45% reduction from the time we began this initiative in 2004. This clearly adds credence to the fact that by reducing the number of days spent on a ventilator, you directly reduce the rate of VAP as well as reduce the overall length of stay in the ICU. Our results reflect the team's commitment to implementing and persistence in complying with the ventilator associated pneumonia strategies. These improvements have been sustained for greater than eighteen months.



How this initiative can be replicated throughout the region

This initiative can be replicated by using evidence-based practices to reduce the incidence of ventilator-associated pneumonia in mechanically ventilated patients. The formulation of a multidisciplinary critical care team was the first component. Our initiative was successful because of the collaboration among the multidisciplinary team members. The team included a physician, nurse manager, primary nurse, pharmacist, respiratory therapist, dietician, care manager and pastoral care. On a daily basis, the team discussed each patient in the ICU and looked closely at the ventilated patients to determine whether or not we were doing the appropriate things. During the multidisciplinary care rounds the team screened all patients for head of bed elevation. This is a critical element to succeed in lowering VAP rate. The literature supports keeping the head of the bed elevated 30-45 degrees, unless there is a contraindication, decreasing the possibility of aspirating stomach contents. Another important aspect of the program is assessment of appropriate weaning. We worked collaboratively with our respiratory team to develop a weaning protocol. Based on certain criteria, every patient is assessed at 6am so that when we do our rounds at 8:30am, the respiratory therapist can report to the Intensivist on the patient's success or failure at weaning and then determination can be made on how to proceed. We also look at peptic ulcer prophylaxis. During rounds we assure that every intubated patient receives some form of prophylaxis. The prophylaxis treatment has been incorporated into our ICU admitting order sets so that it is done automatically instead of waiting for the intensivist to see them. The peptic ulcer prophylaxis protects patients from the inflammatory response to aspiration of gastrointestinal contents and its adverse effects. Deep vein prophylaxis impacts excellent clinical outcomes; therefore we screen every patient and especially, mechanically ventilated patients. The intensivist help to ensure that every patient is on some type of pharmacological agent or on sequential pump stockings if pharmacological intervention is contraindicated. Hypoglycemic control has been demonstrated to improve healing time, decrease infection rate, decrease length of stay and is definitely associated with positive outcomes in treatment. Our organization looked at a number of tight glucose control protocols across the country and developed one for our facility. The protocol involves an insulin drip and the monitoring of blood glucose levels every hour. Our respiratory team assisted the ICU team in maintaining patent airways, and suctioning using our in-line, closed suction system using sterile technique. The respiratory technicians limited the amount of ventilator tubing changes and do not change the ventilator tubing unless it is visibly soiled. All of these initiatives assisted us in decreasing and eliminating our VAP.

The strategies and processes that our hospital implemented can easily be replicated in almost any acute care facility. The IHI bundles are evidence based and are designed to be custom fitted into the patterns and habits of most institutions. The bundles have been proven through numerous studies to prevent infections. The success of the processes that are implemented is contingent upon acceptance by physicians, nurses and all other staff members. We truly believe that these initiatives have enhanced patient safety in our hospital.