

What is the Role of the Allied Health Professional in Preventing Ventilator Acquired Pneumonia?

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Citation

M Scott, S Keene. *What is the Role of the Allied Health Professional in Preventing Ventilator Acquired Pneumonia?*. The Internet Journal of Infectious Diseases. 2008 Volume 7 Number 1.

Abstract

The purpose of this research paper is to look into the role that health care workers play in the prevention of pneumonia. I wanted to see the different techniques that could be used to help the patients that were mechanically ventilated not develop pneumonia. Pneumonia is a problem for everyone, patients, families, and staff. There are many different tools that hospitals can use to help ensure that they are doing all they can to help fight for their patients when they are sick. Different people play different parts in the process of taking care of the mechanically ventilated.

INTRODUCTION

Many people end up on mechanical ventilation each year for various reasons. The time a person spends on the ventilator can vary based on age, health, disease process, and present illness. Time on the ventilator and length of stay in the intensive care unit can be reduced if the patient being ventilated does not develop pneumonia. There are many players and strategies involved in the game to prevent the development of pneumonia while being mechanically ventilated. Nurses, respiratory therapists, doctors, dietitians, and certified nursing assistants all play important roles at the bedside. The purpose of this review is to help look at the many different ways health care workers can reduce the risks of pneumonia in the ventilated patient. Also to see what is your role in that prevention.

REVIEW OF LITERATURE

Pneumonia has accounted for approximately 15% of all hospital-associated infections. It has been the second most common hospital-associated infection after that of the urinary tract. The primary risk factor for the development of hospital-associated bacterial pneumonia is mechanical ventilation (www.CDC.gov, 2005). Pneumonias can increase the chance of morbidity; the length on the ventilator, days in the intensive care units and cost of your hospital stay. The Center for Disease Control also went on to say that pneumonia accounted for 24-27% of infections in the intensive care units.

Many techniques can be performed in preventing the

development of ventilator associated pneumonias in the intensive care unit patient. A successful approach to VAP prevention as described will require a close collaboration among surgeons, anesthesiologists, and critical care staff with standardization of care that begins well before the patient arrives in the critical care unit (Villars, 2007). Some of those techniques are started before the patient even gets intubated. Surgeons before performing a procedure can make sure their patients get a dental cleaning and remove plaque. Anesthesia also joins in the pre-intubation prevention by giving an initial dose of stress ulcer prophylaxis.

An important procedure to remember when a patient requires intubation is clean technique. The workers involved in the process of intubation from the person getting the supplies, to the person at the head of the bed doing the actually intubation, needs to be aware of keeping all equipment clean. The endotracheal tube needs to be kept inside the cover and off the bed in till ready to insert into the trachea. The blade of the laryngoscope needs to be sterile and not laid down on the bed prior to intubation. The mouth needs to be cleaned out as much as possible if the situation allows, the germs inside the mouth can transfer from the tube into the lungs starting the pneumonia process. Cricoid pressure can also help with intubation to prevent the aspiration of gastric content. The pressure of the cricoid pinches off the route to the esophagus.

VENTILATOR BUNDLES

Ventilator bundles are used in many of the hospitals today in

fighting VAP. A bundle is a group of interventions related to a disease process that, when executed together, result in better outcomes than when implemented individually (www.IHI.org). Depending on which hospital you work at, depends on the guidelines on your bundle. Frequency of oral care, positioning of the patient, subglottic suctioning, sedation vacations, prophylactic antacids, and anti-coagulants are a few of the protocols used to prevent VAP.

Findings suggest that twice-daily oral hygiene with a 0.12% chlorhexidine agent may reduce the risk of nosocomial pneumonia in intubated patients more than six-times-daily standard oral care protocol, which does not include the use of an antimicrobial solution (Bopp, Darby, Loftin, and Broschius, 2005). Oral care is done for the patients on a regular basis to cut down on the amount of bacteria growth in the mouth, to reduce subglottic accumulation, and for patient comfort. Oral care and head-of-bed elevation are interventions to decrease risk of aspiration pneumonia in hospitalized patients (Hanneman, Gusick, 2005). With the head of the bed at a thirty degree or higher angle it helps reduce the risk of aspiration. In a study to compare patients at a supine and semi recumbent positions, it was determined that the frequency of clinically suspected nosocomial pneumonia was lower in the semi recumbent group than in the supine group (American Health Consultants, Inc). They went on to say that patient with their heads up tend to reflux and aspirate gastric content less often than supine patients. So when therapists go into the patients rooms to do ventilator checks they can be observant of the head of the bed. Nurses and assistants when done bathing can make sure the patients head is in the semi recumbent position.

Subglottic secretions are secretions that pool below the glottis and above the cuff of the endotracheal tube. These secretions can leak down past the cuff and drain into the lungs causing pneumonia. One way to help cut down on these secretions is a specially designed endotracheal tube with a separate dorsal lumen that opens directly above the endotracheal tube cuff (Hess, 2005). The opening provides a way to suction the secretion out; this can be hook up to low pressure suction or be manually pulled out on a scheduled basis. Hess goes on to say that subglottic secretion drainage reduced the incidence of VAP by nearly half, by reducing early onset of pneumonia. With the reduction of pneumonia, the number of days on the ventilator reduces. Ventilator associated pneumonia is most commonly due to micro-aspiration of pharyngeal secretions around the cuff of the endotracheal tube (Hess, 2005).

Another step on the bundle could be sedation vacation. Sedation vacation is a term used when trying to wean a patient from the ventilator. A short term vacation from sedation is given to the patient to assess the ability to wean the patient for the day. Doctors, nurses, and therapist can schedule daily am trials off sedation and test the patient's ability to breathe on their own. Being aggressive to get patients off the ventilator will help reduce the chance the patients will get pneumonia. Less days on the vent equals less chance of acquiring pneumonia. Included in the bundle, doctors and nurses can help by communicating to one another for the use of prophylactic medications. The use of prophylactic medication for peptic ulcer disease can help reduce VAP. Critical ill patients lack the ability to defend their airways against aspiration. With these preventive medications it can help settle the stomach to prevent reflux. Bundles are used to group effective ways of preventing ventilator associated pneumonia, by themselves they may not have an effect against pneumonia but grouped together research has showed decreased numbers in VAPs in ICUs.

Another technique to look at is the way the patient is suctioned down the endotracheal tube. Open endotracheal suctioning (OES) and closed endotracheal suctioning (CES) are two ways to suction a patient. CES allows you not to disconnect the vent tubing and use a covered sheath to go down the tube. OES is a sterile technique that requires disconnection from the ventilator and suction with catheters. While both have advantages a study done showed no difference between the two methods of endotracheal suctioning (CES and OES) on primary outcome (Peter, Chacko, Moran, 2007).

Diagnosing pneumonia on the ventilator can be done with the help of x-rays, cultures of sputum, and the presences of fever. Quantitative and non-quantitative cultures can be sent from the endotracheal tube to help determine sputum cultures. With the sputum cultures they can help determine what kind of bacterial pneumonia is present. Klebsiella, Excherichia coli, pseudomonas aeruginosa, and H. influenzae are a few of the types of pneumonias. A random study suggested that clinical outcomes and antibiotic use was similar with quantitative and non-quantitative cultures (New England Journal of Medicine, 2006).

As the rise of awareness of VAP grows, the increase of staff education should grow as well. Respiratory therapist, critical care nurses, patient care partner, and doctors all play a valuable role in the ventilator bundle. An educational program focused on respiratory therapists and critical nurses

resulted in significant reductions in VAP rates (Zack, 2002). RT's and RN's can work together to do the oral care for the patient. With frequent suctioning of the patient, it can prevent the accumulation of secretions. PCP's can also help with making sure that the head-of-bed is raised to the desired degree to prevent aspiration. Doctors and nurses can work together and make sure the patient is on the prophylactic medications needed to help with the prevention of pneumonia. Each individual needs to know the bundle at their hospital along with the role they serve on it. Continually staff education and updates need to be presented to help with the reduction of VAP.

CONCLUSION

I have learned from this research that there are many ways to help reduce and prevent the mechanically ventilated patient from developing pneumonia. Once it may have been thought that the doctor was the main person in making sure the patient was taking care of, but there are many people involved in this process. From the time the patient enters the building for a procedure or illness prevention can start. Simple hand washing is something that even family members can do to help with the spread of disease. With the bundles in place at many different places across the country the numbers are on a decline for VAP. Better education and proven techniques can provide better outcomes for the ventilated patients.

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