Vanishing VAE Webinar

December 8, 2014

Speakers: Ellen Simonson, RN, CIC, Director, Infection Prevention and Control; Melissa McClure, MD; Pulmonologist; Joe Wilson, RN, BSN, CCRN; Intensive Care Unit; Paige Mechtel, RN, BSN; Intensive Care Unit; Melissa Fradette, MSN, RN, CCRN, Intensive Care Unit; Roberta Basol MA, RN, NE-BC; Care Center Director; Intensive Care /Surgical Care and Clinical Practice; all from CentraCare Health - St. Cloud Hospital. Joan Brown, RT, Essentia Health – Fosston

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Hello ladies and gentlemen - Welcome to the Vanishing VAE conference call – all have been placed on listen only mode – lines will be open for questions following the presentation. It is my pleasure to turn the floor over to your host Marilyn Grafstrom. Good morning everyone. It's good to have you all joining the Vanishing VAE webinar. We're headlining St. Cloud Hospital and Essentia Health in Fosston. Before I go any further I want to make the announcement related to CME credits for physicians or a licensed healthcare professionals requesting CME credit must complete the CME evaluation form that was attached to the confirmation email and follow the instructions on the form. The speakers have no relevant personal financial relationship with CME activity.

Here is some background into the VAE project. Minnesota hospitals that treat patients with ventilators began working on reducing VAP in their ICUs in 2009 in reporting their bundle data. The CHAIN VAE gap analysis was released in early 2013. HAI mini grant funding was used to bring hospitals together to choose and pilot a series of VAE interventions which ended up being the vanishing VAE bundle. Which is what we will introduce to you today. The Minnesota CHAIN VAE gap analysis is being updated presently to align with the vanishing VAE bundle and will be put out in 2015. The vanishing VAE bundle will be incorporated into the MHA Safe Care roadmap in 2015.

Just to give you some sense of what Minnesota has been doing, we don't have good comparison with other states in the nation but look at our rate over the last few years to give you a sense of how we are performing.

This is looking at NHSN reporting hospitals and there is a 22% decrease in the last two years.
St. Cloud Hospital was our mentor hospital who had done some fantastic work already with VAE and the following hospitals worked on the pilot, creating the bundle, Hennepin County Medical Center and Sanford Health Bemidji and Essentia Health Fosston.

I will introduce our speakers for today. First of all from the St. Cloud Hospital we have Kathy Barton who is an Infection preventionist.

Roberta Basol is the Care Center Director for two Surgical care units. She has administrative responsibilities for strategic planning, outcome management and goal/objective planning and implementation. She is also the Director of clinical practice which includes professional nursing practice, evidence-based and research and resource management. Roberta has held ICU positions including staff nurse, staff educator, and department director for more than 30 years. She holds a Masters in nursing degree and is certified as a nurse executive.

Melissa McClure, MD completed medical school at the University of Minnesota and completed her internal medicine residency there also. She was chief resident at Regions Hospital before starting her pulmonary critical care fellowship also at the U of M. She joined CentraCare in September. Dr. McClure’s special interest include lung cancer, pulmonary nodules, chest imaging, education and code simulation.

Melissa Fradette, is the clinical resource nurse in the Intensive Care Unit at St. Cloud Hospital. She has 14 years of critical care experience. Melissa has been a core charge nurse and staff nurse in the ICU. She received her nursing degree from University of Minnesota and holds a master degree in nursing from Walden University. She is a certified critical care nurse.

Joe Wilson is the staff nurse at St. Cloud Hospital for the past eight years. He transferred into the ICU after beginning his career in the floor pull. He received his nursing degree from the University of North Dakota. He is a certified critical care nurse and in May 2013, Joe was awarded the Minnesota Hospital Association Caregiver of the Year Award.

Paige Mechtel, is a staff nurse in the ICU at St. Cloud Hospital for the past four years and works in the charge support role. Her previous three years of critical care experience was at the University of Minnesota Fairview. She received her nursing degree from the Minneapolis and Community Technical College and completed her bachelor's degree at the Minnesota State University-Mankato. She is currently enrolled in a graduate nursing program through Walden University.

Joan Brown RT, EMT has been a Respiratory Therapist at Essentia Health in Fosston, MN for approximately 12 years. She is CALS certified and is a paramedic, which was her primary role at Fosston before she obtained her RT licensure. Joan supports her rural hospital managing patients requiring ventilation assistance in preparation for and during patient transfers and has been instrumental in developing rural tools for VAE safety. With that I give you Kathy Barton from St. Cloud.

To begin with we want to go over the basic VAE surveillance criteria. And a caveat to this is remember that the definition is changing in January. Always keep up on those updates from NHSN. Training for VAE surveillance can be obtained from the NHSN website. To be eligible for VAE surveillance you have to be in an inpatient department, this is location-based and not aged based. Those not eligible would be patients
who have not been ventilated for three calendar days in a row and also patients on high-frequency ventilation or extracorporeal life support (ECLS).

To meet the ventilator criteria you have to be on an intermittent positive-pressure breathing (IPPB), nasal positive end-expiratory pressure (nasal PEEP); and continuous nasal positive airway pressure (CPAP, hypoCPAP) are NOT considered ventilators unless delivered via tracheostomy or endotracheal intubation (e.g., ET-CPAP)

This is a quick summary within an algorithm to show you the two basic components of surveillance. The first one is a respiratory status component. As you can see you have to be on the mechanical ventilation for more than two days and your baseline period of stability which would lead to your VAC or ventilator associated condition and the second component is the infection or inflammation component. Which will be your general objective evidence of infection or inflammation, results of lab or microbiological testing. Which would lead to your infection related ventilator associated compensation. Other evidence could lead you to your possible or probable VAP.

To go through those briefly - and again refer to the NHSN website for further details. There are many other components to each one of these definitions. But to start with your ventilator associated condition or your VAC helps to determine the respiratory component of your VAE surveillance. The patient has a baseline. Stability or improvement on the ventilator defined by greater than two calendar days of stable or decreasing daily minimum Fi02 or PEEP values. In addition you also have to have a worsening oxygenation. From the baseline you have to have an increase in your daily minimum Fi02 of your 20 points over the daily baseline or an increase in the daily minimum PEEP values greater than equal to three over the daily minimum baseline.

The next criterion is once you've met your VAC status you also have to have your temperature of greater than 38°C or less than 36°C or your white blood cell count of greater than 12,000 cell or less than 4000 and a new antimicrobial agent that is started and continued for greater than or equal to four calendar days. So both of those things would have to be present.

Once that criterion is met you can move on to determining whether it's a possible or probable VAP and that would be using your lab values to determine that. You can see in the possible VAP you have to have purulent respiratory secretions or a positive culture. And this is the only one where the sputum culture will fall in the criteria for meeting a possible VAP.

Finally the last definition will be your probable VAP which you have to have the purulent respiratory secretions and a positive culture. But you will not see the sputum culture as one of your criteria here so as you can see their more deeper respiratory secretions or cultures or instead of those two criteria would be a positive fluid culture positive lung histopathology or diagnostic test for Legionella or a positive diagnostic test on respiratory secretions for influenza virus, respiratory syncytial virus, et cetera.

Hello everyone I'm Melissa McClure, the pulmonologist at CentraCare. I am going to go over again what the ventilator associated event definition is even though we just heard that. And really it will focus on those conditions where you see a sustained increase in your oxygen support after a period of stability. That will represent initially by seeing lower oxygen stats. What we will notice in target for criteria will be a 20%
increase in your Fi02 or an increase in PEEP of 3 from previous. This will include infectious and non-infectious causes but also things like pulmonary edema, atelectasis or PE. The VAE definition does not necessarily focus primarily on VAP. There are three tiers as were outlined previously, the ventilator associated condition is going to be the prolonged increase in oxygen support for two days and focusing as we said not necessarily on infectious things; these two definitions were not entirely sure the relevance yet and this is why it's important to collect data because we don't know that these events are necessarily preventable or even reducible if we can’t figure out what is targeting them. So more information will be helpful. In classifying further for things like infection related ventilator associated complications or the IVAC or when you start to look more about things that show was the hypoxemia where we see the VAC conditions with generalized infection or inflammation triggers and antibiotics are started. These need to be continued for at least four days as was highlighted before. The third tier is where we are focused more on on the probable or possible VAP section. As highlighted before, the sputum gram stain comes into play with the probable and that's looking at good quality sputum and further down with paths have it in identification we can single out cultures that give us the possible VAP when we see that in context with the IVAC and then the focus will be on separating possible and probable VAP.

Ventilator associated pneumonia has been something we've all been focused on for quite some time. It was a definition that came out in 2002 by the CDC. They had found it was a new or progressive and persistent radiographic abnormality developing in a patient on mechanical ventilation and this was within 48 hours of mechanical ventilation. People also had to have signs of systemic illness including fever, white count, altered mental status as well as some pulmonary criteria which were somewhat vague including changes in secretions or cough, bronchial breath sounds and worsening oxygenation. Most people found that these were not sensitive or specific and if they are not sensitive or specific than their less helpful definition for surveillance.

VAP as we know is the most common nosocomial infection in the ICU and causes significant morbidity and mortality which is why a lot of effort is placed on identifying and working through treatment and prevention. Many of the bundles focus on preventive strategies that are based in the pathophysiology. People get ventilator associated pneumonia from oropharyngeal colonization and that can happen in many different ways from the usual normal flora or by things that they might pick up from inappropriate hand hygiene, contaminated water or even in the air. Many issues with VAP come from the stomach, we see gram negative and biofilms can form on the tracheal tubes, particularly this is seen in late onset VAP and sometimes hard to separate from tracheal colonization with bacteria. A primary route of acquiring ventilator associated pneumonia is aspiration of some of those upper respiratory secretions down around the endotracheal tube cuff, lower respiratory tract is typically sterile and we start to see pneumonia it will be from one of the following sources that we will look at. There are also things that are important to monitor for conditions like epidemic VAP - and this can be seen in things like contaminated equipment or air or water. If people are getting the same infection that would not necessarily be found in the upper oropharynx or some of the usual routes, that supports us to keep track of things and routine surveillance for VAP is mandatory.

In med school we learned a lot of mnemonics and sometimes it is your way to remember things. And targeting ventilator associated pneumonia prevention is really focused on figuring out how the pneumonia gets there. Most often it will be one of the following. An aspiration event like we talked about where secretions either get down around the endotracheal tube or somehow into the normally sterile lower
respiratory tract, it will be an extension of infection which might follow down along that same endotracheal tube way, people can breathe things in, contaminant from the environment from other services and pneumonia can also get there through the blood or a hematogenous in this route. That will help us as to why the pneumonia got there and how we can prevent it.

This picture, I apologize if it's hard to see. It's a cute way to remember how pneumonia can get there. There's a tiny eight located behind the nose in the nasopharynx and that will represent aspiration or secretion can come down. B is in the stomach and that will represent the G.I. colonization were we see some of those gram-negative and pneumonias. The rest of the alphabet C which is the person bringing down, water in the sink does the physician or healthcare provider who can sometimes not wash hands appropriately or other things like that coming to contamination, there is a broke scope and nebulizer in the upper part located by the E and the bit that looks like dust underneath the provider standing is another way that aerosols that are contaminated can get into the lungs and cause associated pneumonia.

The way your body helps to prevent this goes in many different mechanisms. One of the large airway barriers. People who are not intubated, coughing is a great way to clear out your lower airway. Also have some inherent mucociliary clearance with sputum production to help prevent infection from getting into the lungs. If bacteria does end up in the lungs there are macrophages that help take care of those bacteria as well as your normal cellular and humoral immunity. Ventilator makes it tricky because when you take away people's ability to cough when they are sedated there is tracheal irritation and inflammation that can lead to increased chance of infection as well as it provides a nice direct extension from the upper airway directly via ETT into the lungs.

To prevent and target these areas where we know that pneumonia can start, many hospitals have created bundles which prevent many of these things. So typically the head of bed elevation will focus on aspiration or any G.I. contact or aspiration from the G.I. tract coming up. A lot of the mouth care will to help prevent any of the normal oral flora from coming down and passing to the endotracheal tube cuff. Lung protective ventilation strategies help to minimize any effect on the lungs but also help speed time to extubation. Focusing so differently on extubation and appropriate analgesia with sedation/vacations and assessing when people are ready for extubation. Some classic suctioning as stated earlier, extubation of people, early mobilizing patients even when they are on the vent and again up to the chair using things like DVT prophylaxis and G.I. prophylaxis following most bundles.

My name is Joe Wilson, I will talk about requisitions for vent settings, sedation, nurse and RT driven vent protocols and spontaneous breathing trials. I will start with talking about vent settings. Recommend initial title volumes of less than 8% to meters of water and retaining plateau pressures of less than 30 meters of water. In doing so you reduce the risk of ventilator associated acute lung injury which then lead to ARDS. Auto pressure should be assessed several times throughout the day with appropriate title volume adjustment. Wilson recommend using appropriate peak pressure alarms to alert the conditions of rising pressures.

The goal of sedation should always be to use the least amount of sedation possible to achieve respiratory stability, ventilator synchrony and minimal anxiety and patient safety. The amount of sedation used to be specific to the patient individual needs. When sedation is used, the sedation vacation protocols goes into place to allow the patient to wake up at least twice a day to assess neurological function and readiness to wean. During sedation vacation it is important to give the patient time to wake up as much as possible and
give them a chance to synchronize with the vent. Prickly station vacations – if the patient is uncomfortable or anxious when in actuality they just haven't quite woken up enough to understand their situation. When using sedation, patient goals should be set in tools such as the breaker or Richmond education sedation scale should be used and documented to a meet these goals. When frequent assessments are not made, patients often become over sedated and are exposed to higher doses of medications than necessary.

Several sedation strategies are used when managing a ventilated patient. Not every patient requires sedation to meet their goals. Some patients actually do quite well being on vents. Some patient may require sedation initially but they require less or no sedation as time goes on.

When intermittent sedation is used, sedation medications are continually given with twice daily interruption.

The last strategy is to do a sedation without interruption. This strategy should only be used in extreme cases such as severe hemodynamic, respiratory or neurological instability when administering the sedation is likely to cause further instability or patient harm.

Patients who are awake and oriented can play a role in developing their own plan of care and can help make decisions regarding treatment options. Patients who are sedated are unable to make decisions for themselves, providers are often placed in the difficult position of guessing what the patient's wishes are. An awake patient can also participate in physical therapy, occupational therapy and early mobilization. Patients in these activities may allow them to maintain their physical strength and decrease their overall recovery time. They can also participate in coughing exercises and things to help clear secretions when they're on the vent. We can also allow the patient to maintain bladder and bowel function. Awake patients can use their call light when they need to go to the bathroom which will reduce the incidence of incontinence. Incontinence in the sedated patient can often lead to skin breakdown, which can contribute to pressure ulcers. Using minimal sedation medication also prevents a necessary exposure to mind altering medications and metabolites which lead to delirium and prolonged hospital stays. Awake patients may allow for earlier recognition of urological change which may also help the clinician recognize other conditions and treat them earlier such as chest pain related to an MI.

The awake patient also makes users perform spontaneous breathing trials as it can be done anytime the patient is awake.

There are also some disadvantage to an awake patient. They may require 24 hour sitter nursing care to monitor fluctuating mentation and prevent unplanned removal of the endotracheal tube or other medical devices. Some patients tolerate being on a vent without sedation, many do not. Patients may perceive their short of breath which can be quite scary and uncomfortable. Some patients are unable to synchronize their breathing with the ventilator which may lead to hemodynamic respiratory instability cyclization. It may be especially difficult for the patient to achieve when aggressive vent settings are needed from his perception of discomfort. Family sometimes have difficulty of patient’s comfort when patient is awake and on a ventilator.

I will discuss the different sedation strategies and the benefits to wean a patient. No matter what, the goal should be the same to use the least amount of sedation possible to maintain respiratory stability ventilator synchrony and minimal patient anxiety.
Next I want to talk about nurse and respiratory therapy driven mechanical ventilation protocols. These are order sets and guidelines for nurse and RT driven ventilator management, weaning and extubation practices. Research shows that RT driven protocols may vary in their elements by institution but shows having them in place decreases mechanical ventilation times and improves patient outcomes. The protocol elements they include are: initial vent settings, order sets for management of pain and anxiety, criteria for performing spontaneous breathing trials, weaning settings and finally criteria for a successful wean and extubation orders. Although the use of such protocols are proven through research, there are several barriers to their use. Comfort levels and experience of nurses and RTs may vary. Nurses and RTs may not yet be accountable for extubation of a patient without physicians direction. Many nurses and service will avoid extubating the patient for fear of a failed attempt and possible negative feedback from others. We can help each other overcome these barriers. It is important for people to realize that it's okay to fail. Sometimes the patient cannot be extubated even by experienced physicians. It’s important for us to encourage coworkers to follow the protocols and guidelines to conduct spontaneous breathing trials for patients when appropriate. We encourage nurses, respiratory therapist and physicians to give positive feedback when protocols are followed whether the attempt is successful or not.

Next let’s talk about spontaneous breathing trials. A respiratory therapist can coordinate spontaneous breathing trials with sedation vacations. A spontaneous breathing trial supports turn off the alarm ventilation feature to ensure patient safety. That settings used during a spontaneous breathing trial may vary by patient or institution itself, in a pressure support with a defined upper limit CPAP or lower mandatory rate assigned. This setting is pretty trusted and limited to about 30 to 60 minutes. Current research suggests that a 30 minute spontaneous breathing trial is all that's necessary and prolonged trials maybe lead to patient fatigue and failure.

My name is Paige and I'm a nurse in the ICU at the St. Cloud hospital. I will talk about the next steps in preventing ventilator associated pneumonia which are oral care, bed elevation and with progressive mobility.

The first steps would be oral care. The guidelines are that we perform oral care every 2 to 4 hours especially with repositioning and increased activity or changes in head of bed elevation. The next recommendation is that a chlorhexidine solution be used to reduce bacteria - potential for bacteria colonization which can lead to ventilator associated pneumonia. The next step would be ensuring subglottic suctioning every six hours and PRN. Subglottic suctioning minimizes pulling secretions above the endotracheal cup which will in turn lead to decreased ventilator associated ammonia.

Subglottic suctioning is shown to reduce ventilator associated pneumonia rates and many patients are not able to just get by with every six hours but also need more frequent suctioning in between.

Who is responsible for the oral care practices? The needs to be a joint effort between the nursing staff, respiratory therapist and support staff like PCAs. Proper education is important so they know why they are doing the care, and they are more likely to adopt practices. On top of being responsible, documentation must be insured in the chart and we all need to guarantee that this is being done. The next step is head of bed elevation.
The head of bed for ventilated patients is 30 to 45 degrees unless contraindicated. Head of bed elevation facilitates the work of breathing and coughing, prevents aspiration of tube feedings and secretions and has been known to have minimal risk and minimal cost to prevent ventilator associated pneumonia.

There are certain populations that are not able to maintain head of bed elevation for certain reasons, spinal cord injuries, unstable fractures or hemodynamic instability. If you're not elevating the head of bed make sure that there is a good reason, and we're documenting why we are unable to do that. Again as with oral care staff education, collaboration is the most important. If your facility is having a difficult time maintaining head of bed elevation consider additional training in chart audit and bedside audits and also visual cues like a line on the wall or using the dial on the bed that assures a your head of bed is at least 30 degrees. Again with HOB elevations - this is a collaborative effort between nursing, respiratory therapists, physical therapists and other support staff.

Anyone who might be moving the patient. Another thing to consider is encouraging our EMS teams to elevate the patient's head of bed during transport. Educating them on the beneficial rationale and contraindications will be important to have them adopt the practices as well. Early progressive mobility is the next step in preventing ventilator associated pneumonia.

Early progressive mobility has become quite a hot topic especially in critical care and among patients who are intubated in the ICU. Early progressive mobility allows the patient to wean and extubate earlier, decreases hospital length of stay and overall cost and has been known to prevent ventilator associated pneumonia as well as other complications like pressure ulcers, psychological disturbances and other neuropathies.

We know that early progressive mobility has a positive effect on cardiovascular and pulmonary systems. Immobility leads to intolerance of physical activity. We also need to remember that not only does mobility work on a patient's strength and endurance but it also helps to aerate the lungs and facilitate the work of breathing and reduce intolerance the patient may have from laying in bed. There is evidence to support that progressive mobility is the best practice and because we know it’s a best practice we should all be doing this.

St. Cloud Hospital committed to a mobility protocol in 2005 and found that this mobility protocol reduced hospital length of stay by 18%, reduced ventilator associated pneumonia by 16%, improved discharges to home by 9.2% and reduced hospital cost by 5.7%.

The next slide shows an example of the progressive mobility guidelines that we are using at the St. Cloud hospital in our critical care unit.

The first section is the standards for progressive mobility that will be the standard for all patients in critical care. This is the stuff we're already doing the turning every two hours, head of bed elevation, range of motion with turns, and of course documenting barriers that would limit the progression or contraindication.

The next slide is a list of exclusions that would exclude patient from progressing with their mobility. As always clinical judgment needs to be the first thing on the nurses and physical therapist mind, before they progress a patient's mobility. The goal is to move as many patients as possible while maintaining safety.
we need to remember that just because they are intubated or on a basal presser does not mean you cannot mobilize them.

The next slide breaks down the levels of mobility from sitting in bed in a cardiac chair position or biodyne. All the way to marching in place and ambulating in the hallways. We need to remember that this is a cyclical process so if a patient fails at sitting at the edge of the bed it does not mean that they need to go right back to complete bed rest but the next time maybe they could dangle at the bedside or try something that is not strenuous. Another thing to remember is that for many who are between level II to level IV - a physical therapist must be involved in the progression to have the assistance with moving patients.

This slide are steps in implementing mobility for your facility. The protocol developed just as much work as it is to actually mobilize and implement the patient. But developing a protocol that has a good foundation is a great standard to start with so that people will adopt and use this protocol.

The biggest thing I can point out on the slide is that there must be a collaboration between nursing, better physical therapy and physicians so that you have stakeholders in all of the areas to assure that everyone is on the same page and everyone has the same goal about mobilizing patients. Again staff education is very important. They need to know why it's important before they will adopt these practices.

Showing them statistics and proof that it will work and is safe is a good place to start. Communication and cooperation again among all of the staff including mobility in your daily rounds might be a good place to get more people on board. Adding mobility to the care plan and again continual assessment of your protocol to make sure that what you are doing is working and to assess if any changes need to be made.

The last slide shows some tools that I use to pull some of this information. These are great resources and there's a lot of information on the AAC and in Johns Hopkins websites to develop the mobility protocols that can be used in your area.

This is Jane Brown from Essentia Health Fosston. We are 25 bed critical access hospital with an emergency department and Level IV trauma center.

We want to focus on packaging our patients and getting them ready for ambulance life flight or whoever transfers our patients and following the same guidelines as everyone else in dealing with head of bed, good tracheal tube care or the tube is secured early and many times what we will be doing is using our BIPAP in a critical access hospital, before mechanical ventilation happens.

We have developed a VAE simulation tool that will be very helpful for critical care access hospitals to help with our competency with mechanical ventilation and I would like to thank Tammy Hale for helping with that.

Again I want to go over some of the things that we will work with for patients being transferred, using tidal volumes less than 8 ml, keeping the head of bed up, good oral care, and many times whether the patient goes by air or by ground which could be two hours or by lifeline, they still have to maintain some of these care for patients good outcome.
This is Roberta Basol from St Cloud hospital. We're 489 beds hospital for the CentraCare health system and three times magnet designated. You can see some of the designations we've received. We have two adult critical care units, one pediatric ICU and in our 4 progressive care units. Our medical progressive care unit does take ventilated patients. For long-term vent or not actively weaning patients.

Our intensive care unit is a 28 bed multi-specialty ICU where we take a variety of different types of patients. We are Gold Level Beacon ICU and we've had an intensivist program since 2004. We also have a hospitalist program which is part of our intensivist program. We do multidisciplinary rounds twice a day on each patient and have had a history of evidence-based protocol driven practices for more than 10 years.

As we talked within our group these are the process measures that we developed for MHA to look at. When you're measuring patients head of bed elevation and we defined the numerator and denominator there so we can compare apples to apples. We sampled 30 per month when you see our data. One point of interest that came through our discussions is a couple of years ago we purchased a new ICU bed and still had some of our old ones. The nurses were noticing the 30 degrees on this bed is 30 degrees is different than a 30 degrees on another `we actually took the bed side by side and our maintenance staff found that one of our beds had 30 degrees was at 21 degrees. We are in the process of getting replacement parts for that bed so that it measures accurately. It might be something you want to check as well. Oral care Q4 within the 12 hours and we look back 24 hours for that measure. In a number of patients sedated we sample 30 per month.

In our daily sedation vacation we're doing a direct observation for this measure in looking at patients within intentional sedation weaning and excluding patients with contraindications. Our daily assessment of readiness to wean determines if we actually have done that in an our subglottic suctioning Q12 we do not use continuous suctioning here.

Our mobility progression is a new measure, we have never checked in this manner before. We were looking at mobility progression more by physical therapy consult. This is a new measure for us as well. We're looking at the day of mobility in terms of how many days they have been on the ventilator but to see if these patient were ventilated for more than 24 hours.

Now we're looking at infection measures with Ivacs and VAC.

This is our ICU data to give an idea of the number of patients of the last three fiscal years as will the current quarters. Our hospital like the state reaches from 8.12 the last quarter to the last 8.92 to 3 years ago. Our length of stay in the ICU is just under two and half days currently and you can see our range in total days has dropped each year as we continue to improve care of ICU patients. We look at the ventilator utilization rate this is compared to data you can get from NHSN with a much higher ventilation utilization rate and the reason that's changed is that we've had a significant increase in interventional neurology patients who aren't ventilated so it dilutes our numbers but it doesn’t dilute the fact that we still have about the same number of patients on a ventilator. Just for a short length of time as you see on the next row for the average hours the patient is on the ventilator.

This is a graph of our possible trouble VAP measures. That's what we looked at over the last number of years since that criteria changed. And you can see we have not had a probable VAP in the last two years but we have had a few possibles. We measure those very rigorously.
Our measures on these new VAE measures we identified just those which are these measures in September 22 months to show you. Our head of bed elevation with a couple of misses there on our sample size was I believe in the first quarter or September. Patient sedated was interesting we were sedating everyone and the reason that some of our patients were not sedated was that with direct observation we found patients that weren't sedated at the time of being observed and that some of the patients were alert enough to follow commands and respond appropriately and did not need sedation, some had intermittent pain medications but not for the purpose of sedation and there were some patients who do not need sedation because of their neurologic status postcode or stroke. We're doing a good job of daily sedation vacation in daily assessment to wean in our subglotti suctioning. Mobility progression is new measure for us so to look at see their average with 30 patients in September was day 4.1 in October day 6.5. We're going to see if we can improve that and reduce that to be an earlier time. These last two month we do not have any possible or probable VAP.

I'm Melissa Fradette, a nurse clinician at ICU. I will review a case study which walks through the criteria for each of the VAE categories. The patient will meet the criteria for each VAE event despite being placed on a mechanical ventilation bundle which has all the VAE prevention components.

Mr. M has a primary medical history of lymphoma. He's admitted to the medical ICU for hypotension after presenting to the ED with nausea, vomiting, and diarrhea. He also has a productive cough. He's intubated and mechanically ventilated for respiratory distress within 24 hours. And so ventilator settings are a TV of 7 ml/kg, flow FiO2 of 0.70 and a PEEP of 5 cm of water. His head elevation was 30 to 45 degrees, oral care was completed every two hours including the ID exiting application and subglottic suctioning was completed every 6 hours and PRN after patient revisiting or head of bed elevation changes. As you can see on day two entry has FiO2 is decreased to 0.35. Progressive mobilization was initiated in Mr. M with assists of PT dangle at edge of bed. On day four and five the FiO2 was increased to 0.45 and then to 0.50. Mr. M mobilization was increased Pt assisted sitting up in the chair for 45 minutes. His increase in oxygen requirements was attributed to his increase in activity.

On day seven his PEEP increased from 5 to 8 cm of water. His temperature exceeded 38 degrees and initiated within the five day window and continued for five days. Secretions are aspirated fia ET and sent to lab for sputum gram stain and culture. On day eight there was no change in ventilator settings and a bronchoscopy was performed and sent to the lab

Looking at this does Mr. M meet the VAC criteria? Was mechanically ventilated for at least two calendar days? Yes he was. Was there an increase in the minimum daily FiO2 of 0.20 or more from baseline or a PEEP increase of three cm of water or more following two days of stable or decreasing levels? Yes. Whether increased FiO2 or PEEP levels sustained for two calendar days? Yes for the PEEP levels.

Does Mr. M meet IVAC criteria. After the IVAC criteria is determined if the conditions lead to an infection. This requires assessment of objective measures that commonly indicate an infection. The patient must have a change either in temperature or in white blood cell count. The patient must be started on a new antimicrobial agent is contained for four or more calendar days. These criteria must be met on or after three days of mechanical ventilation and within two calendar days before or after onset worsening of oxygenation.
To meet these IVAC criteria, is there a temperature greater than 100.4 degrees or less than 96.8 degrees? Yes

Is the white blood cell count greater than 12,000 or less than 4000? Now was a new antimicrobial agent started and continued for more or more calendar days? Yes there was.

Does Mr. M meet possible or probable VAP criteria? The patient must have purulent secretions or positive respiratory culture within five days of the worsening oxygenation. These are determined from a Gram stain and not from yellow or green respiratory secretions. Purulent secretions attain 25 or more neutrophils and 10 squamous or fewer epithelial cells per power field like scope. To qualify for a probable VAP the patient must have purulent secretions and quantitate analysis of respiratory specimen that meets company forming units threshold and determined by the specimen type. In this instance it would be from his bronchoscopy. So were there purulent secretions present? In this case yes. Mr. M secretions contained the 25 neutrophils in less than 10 squamous cells per low power field. And were his bronchoscopy aspirates positive? I will tell you yes they were. His positive culture for Pseudomonas aeruginosa via from bronchoalvelor lavage at 10 to the fourth power on the colony forming units. And for each have 10 to the fourth power.

Here is our references on pg. 69 of the slide presentation.

Marilyn Grafstrom - we have some time for questions but before we go into that I want to let you know that I don't believe the tools are all there yet. On the MHA website there will be a vanishing VAE webpage. I'm hoping sometime this week but we will send an email out to all of the participants to let you know when that is alive. It contains the VAE bundles, a resource page that provides background and references for the bundle as well as more tools and links to more resources around VAE. There also are tools that St. Cloud provided that were in our webinar today. I think with that I will go ahead and see if there are any questions.

The line is open for questions. If you have a question is press seven on your telephone keypad. While we wait for questions, as we were rolling out this work I remembered Roberta in St. Cloud telling us about the early mobility in sync how the nurses in the beginning were reluctant to begin with early mobility measures. She described it a beautiful process where the physicians were coaching 1:1 and walking through these scenarios with the nurses to increase their comfort level with the early mobility measures. Roberta I don't know if you want to talk about that.

Sure. I think having multi-disciplinary rounds twice a day makes a difference. Having the physicians present and talking as a group as well, but we have a set checklist of things we're checking. We still need central line and foley cath, things like that. And if the patient is on a ventilator, can they get up and sit up, have they been sitting up? Unable to stand at the edge of the bed? What is their ability to get up? I think the discussion in a multidisciplinary group makes a huge difference of having the support of the physicians and talking about what some of the challenges might be, and having the physical therapist there to say yes we tried it and here's what happened. And respiratory therapy is right there as well. That's made a big difference. I think we just need to continue - identify as such as a key measure to getting the patient oxidation and off the ventilator sooner. The literature is so strong on how early mobility impacts shorter ventilator days and shorter ICU length of stay.

Perfect thank you. Are there any questions?
The first question is regarding your twice a day rounds. What is the time of your second round?

We have rounds at 9:15 in the morning and those are more of a tabletop round where we go over the basics, who is transferring in and out, updating what happened overnight on patients, a brief summary and then we focus on does everyone have the bundle components? Does everyone have their DVT prophylaxis? Does patient have a urinary catheter still? If they do, can we remove it? And then the central lines is another key thing that we talk about, we also get our social workers involved in the talk about where we are with placements on long-term care facilities and things like that. Our afternoon rounds are at 2:00 in the afternoon and those are bedside rounds, we cover all of those topics plus families are involved and the patient's bedside nurse.

Who runs the rounds in the morning?

The morning rounds are charge nurse led with physician involvement. There is one of each discipline in the tabletop round and then in the afternoon if the physician is present, they are physician led but more often than not they are nurse led with physician involvement. In terms of most of your patients that are mobile, what would you say their average FiO2 is on the vent? Less than 40?

Probably I would say between 40 and 50 and more than likely less than 40.

Thank you

This is Marilyn at MHA. I want to address one more thing because I know that my partner at MHA would be sad if I did not bring this up when we talk about 30 to 45 degree elevation. I want to see if maybe Joe could respond. As far as our MHA VAE roadmap points out that if elevation is at 45 degrees or any higher than 30 that's a potential for a pressure ulcer risk. Our roadmap actually directs the elevation be closer to 30 degrees and do you have anything to add about that?

This is Roberta. I will share with you what our rates have been if that helps. In the last quarter we have three pressure ulcers 2 deep tissue injury and one stage two. Of course that varies depending on the type and class. If there are trauma patients with deep tissue injuries generally from those are the severely hypotensive. A couple quarters ago we had one. And that was not actually on the coccyx. But of the three I mentioned were all on the coccyx. In the last year we had five on the coccyx, three in the last quarter and again the tissue injury, I always think about that severely hypotensive or trauma patient.

I think that is low. I know that MHA wants it to be zero and we want to be at zero. But we have a skin champion in our ICU that's been in evidence-based practice project, one of our nurses has been our skin guru that's always looking at what are we doing to maintain our patient's skin integrity.

Perfect. Thank you so much all of you in St cloud

I want to say thank you to St. Cloud and to Joan at Fosston who presented to you. Another great job and thanks for joining and I will turn it over to Mary.
I want to let you to know I will email a link to an evaluation to everyone after this call. There will be certificates of participation for respiratory therapists and there will be a different certificate for all other healthcare professionals and also if there are any physicians on the call all that information was emailed on December 4 in the confirmation email. There were several documents if you want CME credits. Thank you so much.

Have a good day everyone.