Ventilator-Associated Events Webinar Transcript  
Presented May 19, 2015

Please standby for realtime captions. >> [ MUSIC ] >> Hello. And welcome to thank the later associated events. A patient safety opportunity. The name is Mary Beth and I will be in the background to answer any technical questions. If you experience technical difficulties please dial 866-779-3239. Please note that as an attendee, you are part of a larger audience. However, due to privacy concerns, the attendee list is not displayed. As a reminder, this call is being recorded. You may ask a question any time during the event by entering into the chat panel on the lower right of your scary -- green. We will be holding a live you in a session at the conclusion of today's presentation. To ask a question, choose the rays and icon at the bottom of the panel and we will call on you. Please note that to ask a question, you must have a phone icon next to your name. If you do not have a phone icon, hang up and dial back and. To get the dial-in information go to communicate at the top left of the screen and select audio conference. You may ask an online question anytime throughout the presentation by entering at into the chat panel in the lower right of your screen. With that, we invite you to sit back, relax, enjoy today's presentation. I would now like to introduce your moderator for today, Jamie Moran.

Welcome to our webinar. My name is Jamie Moran Eric I am joined by Martha Jaworski. We reckoned -- we were a percent quality health. The quality improvement organization for Washington State and Idaho. It is our pleasure to welcome you today including our colleagues in QIO this across the country. It's also Michael Clampett. He is an associated professor. And associated hospital epidemiologist at Brigham and woman's Hospital in Boston. He attends on the infectious diseases and internal medicines of it come hospital. He has published widely on surveillance, diagnosis, prevention and treatment of ventilator's -- associated pneumonia.

Marybeth has are ready taken care of some of our housekeeping options. There will be an opportunity to ask questions at the end of the presentation. You are also you -- welcome to use the chat function.

At this time, I would like to turn the presentation over to Dr. Columbus -- Dr. Michael Klompas . Stack take you very much. I appreciate the opportunity to speak to everyone today. It's a real pleasure to be able to talk to people on the front lines. Were grappling on a day to day basis on a -- on safety for patients. Trying to put these into action.

We are talking about ventilator associated events. What I will try to cover is why these definitions were created, what we know about them and strategies for prevention.

I do have funding from CDC for grants for effort research. The starting point of this talk is historically speaking, the AP used to be -- VAP for populated ventilation and ICU. I think the reason for that is
common effective 10% of patients including hospital stay at a very crude -- high crude mortality rate adding substantially to care. Because of that, our primary interest was clinical. We wanted to prevent our patients from having these nasty events.

However, in this day and age, so balance is something purely internal comment related to a hospital zone efforts to improve care for patients. VAP is very much under the spotlight. A lot of people are paying attention to those rates. It is no longer something an internal affair but something that people [Indiscernible] update health departments, joint commission, CAS and others are all paying attention to. It's big implications for the way that we conduct surveillance, the interpretation and strategies for prevention.

We will try to explore some of that together. Just in terms of documenting the attention that is being paid to infection surveillance, this is [Indiscernible] reported Association of healthcare associated infections. You can see that just about every state in the country has some sort of healthcare associated infection Association. Historically, only a very small number of states reported condition to the state health department. There has been a lot of pushback from hospitals regarding the difficulties around surveillance and definition. But I think the sensibility was that if the state is requiring us to report essential [Indiscernible] infections, bloodstream infections and so forth, he would not be long before they start to ask us to report the associated pneumonia rate as well.

We know that a couple of times, the joint commission has proposed making it prevention of ventilator associated pneumonia one of the goals. I think that is under consideration Fort Wayne 16 last I heard. And each case, pushback from the clinical audience around definitional issues. But aspirations of the joint commissions.

Then, as we know, CMS no longer compensate us for certain complications of medical cares -- such as catheter ETI as -- etc. They have been explicit. They would like to do later associated pneumonia to be a non-reversible complication of care. And him the reason they have not done so is because of their own difficulties with the older definition.

Now, the problem is that all of these initiatives presume that we can accurately say who does and does not have a VAP. That I would like to share with you is the fact that the AP has a -- VAP is a particular diagnosis -- difficult practices. The first question you might ask is simply how to do find VAP and if you go to literature, there is a slew of definitions. I have laid out six definitions for pneumonia. CDC oh definition, new definition, helix criteria, a CCP criteria etc. You can layout different criteria that each of these definitions look for.

What strikes you immediately is that all of these definitions are different. And it won't surprise you to know that if you applied each definition to the same population, you would get different rates of VAP. The problem is that we don't know which one of these definitions we should write. We have nothing to say that one of these definitions is better than another. So you see it has been wild trying to decide
how to define this condition. The fundamental critical challenge is that for a large population, a patient on a ventilator, many things can go wrong and they all kind of have the same final set of signs and said that kind of look like VAP. The many complications in critical care for objective clinical fines and the for all intents and purposes like a VAP. So the signs of VAP our capacities, fever, adenoma what it so count impaired oxygenation and increased pulmonary secretions. I am sure that you would agree that each of them can be caused by different things.

We have actually documented this. If you take these for clinical signs and USS them to an biopsy or autopsy, it turns out we have predictive values of whether pneumonia is present -- present are not. These are 14 studies including 600 -- 655 patients. Relative to his dodgy, autopsy. And the results are here. [Indiscernible] and if you recall back in your studies, the likelihood ratio test to how to take your pretest probability that the patient has pneumonia, the patient has a sign, you multiply the [Indiscernible] and that can show you the probability of condition you are worried about. Since we put, if the likelihood ratio is one, it does not change your confidence one way or another as to whether or not the patient has the condition or not. Will you did here is all of the cardinal clinical signs of pneumonia, likelihood ratios looked exactly like one. Eating it does increase your confidence at all. As to whether the condition is present or not.

Nothing brings it home better than the king at HX -- chest x-ray. A portable phone, chosen at random from one of my patients. I am sure it looks familiar to anybody. At first look, I think we can all agree it's an abnormal form. However, it is difficult to interpret it. The patient sitting, the patient is rotated, a lot of overlying tubes and lines. While we can all see again that there is something wrong with this patient's lungs, this stuff over here should not be here. Who can say with confidence what the actual problem is? If you noted -- if you know the conditions, nurse, doctor, respiratory, it could take a cardinal of professionals to interpret. One radiologists. Here is the report. Diffuse patchy airspace disease right greater than left with a obliteration of both Kimi diaphragms. Capacities possibly slightly increased since yesterday accounted for changes in patient position and inspiration. In other words, they could not tell either. That is because there are lots of things that could go wrong with a patient on a ventilator and they all kind of look the same. We cannot really tell them a -- apart. Looking at people who look for all purposes like they might have the AP, -- VAP. What they did is pick a study. They went to try to work out what exactly was wrong with the patient. It could of been a biopsy, autopsy, lots of images -- what they found was a consolation that it first looks like VAP and even interest rates -- infiltrates. ARDS, diffuse and bill are damage, also at the things causing these infiltrates. Not pneumonia. Interestingly enough, in many cases, they found a patient with two or more conditions of non-pneumonia that looked nothing like pneumonia but when present at the same time give the impression of pneumonia. Our example, the patient might have increased secretions from the tracheal bronchitis. They might have a fever from a central line blood infection or ETI or drug reaction. None of us is going to be pulled into thinking it is
pneumonia. But what if at the exact same time, the patient had abnormal chest x-ray because of extra fluid on the lungs or partial collapse or bruising or fibrosis? Individually, none of these look like pneumonia. Collectively, to give the clinical impression of pneumonia.

You could simply document the many ways we could be faked out by clinical picture of pneumonia caused by many other things.

There is a very nice study, and an autopsy series, the like -- the lack of accuracy or clinical signs. This is 253 patients who went to autopsy. They applied a loose definition and restrictive definition for pneumonia and looked to see how well did it protect the absence of pneumonia. The new definition was the patient had to have it unfold trade -- infiltrate and to abnormal others. To currency is sensitivity is around 55%. And they said that is not oppressive. Let's make it stricter. What if we require the patient to have infiltrate and all three? For a moment, over here, I think that the vast majority of commissions would call that pneumonia. Right? They would put the patient on antibiotics and move on.

None of this would actually [Indiscernible] analysis of what would happen if they went from the loose definition to the strict definition. Dropping sensitivity to below and barely positive predictive value. In other words, confirming our concern that the picture is not very accurate. You might be saying to yourself, hang on. I have left out the most important criteria which is the microbiology. The ammonia -- pneumonia is infectious. You should be looking at the microbiology. To try to work out if the pneumonia is there or not. Let me show you that data.

Here is data from six different studies. Assessing the accuracy of quantitative BAL cultures in route to autopsy. What you can see over here is not much better. The sensitivity of a positive BAL quantitative culture around 50%. The positive pretty the value [Indiscernible] but the reality is it comes around to about 75% or so for predictive. How can it be? With the Michael elegy is not date gnostic. Sensitivity is poor meaning you missed two cases. Faults negatives. Right? That is due to prior exposure to antibiotics. Or failure to sample the exact right segment of the long. In other words, the pneumonia turns out to be patchy. If it's in the top right, you have to go to the middle and that is why you miss it. All about false positives? How come we cannot say that every patient with positive BAL has pneumonia. It turns out there is lots of potential to contaminate microbiological specimens. The problem is that the mouth and tracheal tube are packed with organisms and it's easy for the sample to pick up some of those organisms on the way in or out. You can get a positive culture that represents harmonization of the tracheal tube other than infection of the lungs. That is why you get a false positive.

It's not very reassuring at all. But it simply turns out that the clinical reality is that we simply select tools to dark nose this particular condition with great certainty or great accuracy.
As many indications for clinical care. We're going to focus on implications for surveillance.

Here is CDC's old surveillance definition. The one that got replaced two years ago. Field definition required a patient to have graphic criteria, systemic signs and to a more pulmonary science. From these together and you will see these the exact same signs. The chip -- the chest radiograph is not diagnostic. Everybody in ICU has abnormal temperature or white blood count at some point. And how about these pulmonary science? Set of peril and sputum those purulent sputum. None of these are specific to diecasting pneumonia. It I think you would agree with me that they are highly sit active. Nothing in this highly subjective. Nothing in the definition that tells you what constitutes a change in the character of sputum work what increases or decreases suctioning requirements. Who makes the call? Nurse? Dr.? C-section prevention is? How many observations are required? One? To ask three but how long does he -- is he sustained for? All of these questions were left to the discretion of the Observer, the infection prevention is. At the queue and well imagine how two different web -- well-meaning might choose these criteria slightly differently and therefore them up with different rates. In the state that we are in is that our rates are under the spotlight. And C-3 cares about them and CMS cares about them and the state health laws care about them. The fact that differences of judgment might lead to [Indiscernible] is a real problem. It means essentially, we cannot compare with the rates between one observer and another.

In summary, the old definition was complicated, labor-intensive, subjective, and for all of that work and all of that hard eight, you had to go through to come up with an answer, it was still unspecific. There is a lot of work with not much gain.

This problem of differences of interpretation all trying to do the best job possible was in a study we did comparing infection among infection [Indiscernible]. We took 50 patients. Independently evaluated by three different infection prevented us. Between 11 be a fuse and up to 20 BPs. -- VAPS. Which is less than anyone found alone. The problem is that we cannot say which of these infectious preventions are correct. Is it this one? Or is it this one? Or this one? And the answer is, we don't. No. But if you are really worried that people from [Indiscernible] are trying to put pressure on you to get your VAP rate as low as possible because they are responding to pressures outside. I will argue that IP number one over here has got lots of job offers. And IP two is out looking for a job because it's not fair. We all know IP to should be the one who is correct. >>. Is another demonstration of the same problem. Is was published last year. They took six case vignettes from patients who may have had VAP and sent them to hospitals around the country asking the person responsible in that hospital to tell them how many of those six cases were VAP. How many were the criteria. What you will see is there was a red distribution. An equal number of respondents. One BFP -- one VAP. Two, three, four and five. No consistency whatsoever.
If you look clinical, you can take the information we share together and I have actually given you the secret to have used the old VAP definition. You could lower your without actually doing anything. That narrowly interprets subjective clinical signs. When you show up? Probably not. Narrowly interpret radiograph. I am going to say it's not pneumonia. The consensus between multiple surveyors. I showed you we have three different surveyors assessing patients. Individually, they found between 11 and 20 patients with pneumonia. The collectively, they only found seven. Anytime you choose an agreement between multiple agree -- individuals, that will be smaller than any one person alone.

Allow clinicians to be tough [Indiscernible]. The problem with this is it defined the definition in the first place which is just -- try to say that we recognize results vary from doctor to doctor. Therefore we create surveillance to try to become more subjective. Even though we agreed it is not subjective, nonetheless, it was an attempt to bring uniformity. >> You have given up all pretense of any kind of comparability across the lines.

Finally, increased use of quantitative the AL for diagnosis. Is the number of true cases of pneumonia. If you require confirmation, [Indiscernible].

The irony is if you look at these five things, they might be the sort of measures you might say to yourself that kind of look like they increased the rigorous surveillance. That should make it better, right? Why not be stricter with your interpretation. That's him like a really good idea at first. And while it might be good in principle, the actual practical application is that all of these things would need to decrease in your observed VAP rate and then have to do with changing or improving care.

We look at rates in this country across the past decade. We will see that there has been a dramatic decrease. The problem is, we don't know how much of that decrease is due to better care. And how much of that decrease is due to stricter applications of subjective surveillance criteria.

When you cannot tell, if the lower rates mean better care or stricter surveillance, arguably, it's the same definition in the pointe has failed you. It is no longer doing you a good lead.

This concludes that surveillance artifacts might play a large role in dropping rates. Looking at VAP rates in the United States compared to colleagues in Europe, our VAP rates over here our food order of magnitude less than our colleagues in Europe. I don't think any of us would have the gumption to argue that we are 10 times better at providing care.

The other clue is that there are a number of studies now comparing simultaneous surveillance conditions versus [Indiscernible]. The typical [Indiscernible] is that prevention is far fewer cases compared to the commission.
We are no longer -- cases we are finding in infectious prevention, infectious control people, or blogger have much of a correlation with what is happening on the wards.

I know it, if you look at -- take a cross-section at any given time, you will find that 50% of patients are receiving antibiotics with no respiratory infections. Yet, how do we square that. Extensively, there are no more longer any VAP in our units. These are all of the clues that our definitions of either give us a read of what is actually happening on the ward expect the way to -- we does this leave hospitals? Like I said, the fundamental attention. On the one hand, you have those who say we need to put -- we need to publicly report the rates to catalyze improved quality pair -- quality of care and save us. But the definition of VAP is ambiguous, hard to implement and open to be gained say others. What is happening is the hospital is caught in the middle. What are we to do?

CDC recognized this crisis and recognized something had to be done. With the call together was a stakeholder meeting -- stakeholder meeting of all key societies that have an interest. There were clinical groups, care medicine, rest therapy, versus, doctors, it in the all just, the invention -- infection prevention, they settled -- they said to this group, you must do something. He must come up with a new approach to expect what this group did was pretty interesting. They come up with an event -- an event. If the core lesion -- if the correlation is at the end of the day we cannot tell who does and does not have pneumonia, while we pretending we can do so. Either more, why is it that quality of surveillance is only focused upon pneumonia. What about all the other things that can go wrong with a patient on a ventilator? What about ARDS, excess fluid, dark reactions -- drug reactions etc. Don't we care about those as well? That we want to know about them? Event them?

With a said is what we change the focus? Let's stop focusing on pneumonia per se. Let's focus on surveillance on complications in general. The syndrome of risk deterioration of a patient on a ventilator. [Indiscernible] our multi fold. Number one, it's a more accurate description of what we can and cannot tell. We can't really tell who has pneumonia but we can tell with him but he is deteriorating. The big thing is that once you have given up the illusion that you can actually say who does and does not have pneumonia, that allows you to substantially simplify the definition. This allows you to make the definition objective, more reproducible, and to even enable automation of surveillance [Indiscernible] potentially for your infection control program.

That is the genesis of ventilator associated events. The core condition as you know is ventilator associated conditions defined the principal on a patient on a ventilator who is stable or improving for at least two days. And then, suffered sustained deterioration for these two days. The pricing -- the patient had a trajectory change. We look at two times -- two kinds of ventilator associated conditions. The FIA 02 is [Indiscernible] oxygen. We are taking the patient's best value of the day. And can we see a patient having today's of decreasing settings on
either one of these variables followed by two days of increases above the specified threshold?

So if we scan down our example patient of the here of late outpatients if I took value of the day -- you can see something happened on January 5. The patient's peak jumped up to eight. And that defines a patient's the AC -- VAC. You can see how simple it is to do that case finding what you have developed a way to make it simple to read.

As you know, there are some criteria to look for different sub classifications to try to work out which VAC [Indiscernible] and which of those I that -- IVAC should be pneumonia related. The correlation really is the BAC -- VAC. In an example, same patient we have before. Same VAC clearing for January 6. Peeking from 5 to 8. What we do is expand out in today's on either side of the VAC and see if we can find abnormal temperature or white blood cell count. Yes we can. Can we start -- can we find the start of new antibiotics? Yes, we can.

Call about pneumonia? The same patient as before. Can we actually find evidence of positive cultures? Or problems with any kind of amount of culture. This patient has a problem with the speed of measuring [Indiscernible] and a positive culture. This patient will qualify for a P back -- PVAC possible pneumonia.

The beauty of the system is that you can see how it can be fully automated. This over here is a screenshot of online VAE calculator where you can enter in your day by day Valeurs and the website will spit out whether the patient has VAC or IVAC. The proof of the principle that this part -- entire process can be calculated. Only one patient at a time is not useful. As for teaching or checking the case but not giving you efficiency trying to do surveillance for 50 people across the [Indiscernible]. Therefore, a number of institutions have worked on a way to automate this entire population. Two recent publications, a couple of institutions that have automated surveillance say they have a computer to do everything for them.

What do we know about these conditions? There have been a dozen different studies on VAE epidemiology and preventive. Is a growing literature. I would like to share a few of those highlights with you. This one is from the Canadian critical career trials group. What they did is this is a study on [Indiscernible]. They compared VAE versus VAP surveillance. The exampled 30 patients over a two-year period and ended up with 1330 patients. The first thing you see is that the VAE and VAP rates were similar but when you actually look to see the patient's, it turns out to be different.

That is a message that has been published multiple times. The VAE and VAP are a pretty poor overlap. Only a fraction are VAE and likewise only a fraction are detected by VAP. We will talk about that discrepancy as we go along. I think the key message is to recognize that they are different. What actually is cause of VAE is [Indiscernible] pneumonia. At least four different questions I am aware of would've done qualitative analyses of patients or VAE. There was an
actual clinical event that led to [Indiscernible] and triggered off VAE. The results from all of the studies across the system turn out that for conditions account for the vast majority of [Indiscernible]. That is [Indiscernible]. If the portions slightly vary, it is essentially the same. Those for conditions account for the vast majority of VAE. VAE is not VAP.

Is caused by pneumonia, excess fluid, ARDS and fluid. The nice thing is that while VAE might be new to us all, we may not know much about it, we know a lot about pneumonia. And we can apply those lessons that we have gathered across the years over the course of these conditions and mitigate and prevent these conditions and apply that to VAE prevention.

The other mentioned that has become very clear from literature is that VAE are a morbid condition. Associated with [Indiscernible] patients. There are six studies which to measure the mortality of VAE in four cases they were able to compare it to. The results are remarkably consistent. Each study found that VAE is approximately associated with double the risk of dying compared to a patient without a VAE. The studies compared VAE mortality to VAP. We have four cases found.

I am sure you have heard, there have been a number of criticisms of VAE as a concept. I summarize. Most BA he's -- VAE's are not pneumonia's. Lots of no money is are not VAE criteria. VAE Mrs. many pneumonia's. Right? VAE Surveillance open to be gained. Let's consider these together.

The fact that VAE surveillance captures many things other than pneumonia, that should not be a surprise to you. We said on the onset that there was very much the intent. The mission of VAC to expand beyond pneumonia to make sure we captured the additional complications of critical care that are really bad for a patient. The fact that the positive addictive value is low should not be a surprise. It's intentional.

What about the fact that the VAE Mrs. a number of clinical diagnosis pneumonia. What can we say about that? If you think for a moment, you will see that in order for the VAE to miss a pneumonia, it means that the pneumonia did not require a junk -- job amidst settings. In other words, there was a pneumonia not bad enough to acquire increased support from the ventilator. And I told you, we explored together, how difficult it is to actually know when a patient does or does not have pneumonia. And the potential for false positives is a direct correlation. So someone that has pneumonia does not have increased physiological stress, our -- markup of demand. You have to wonder, is that a potentially false positive or is it a very mild pneumonia clacks.

In essence, what the ACE -- VAE is doing is [Indiscernible] it turns out from a qualitative point of view, the focus on the most severe event is a common strategy for years. If you think to yourself about those in infection prevention, you put the majority of the effort in finding deep surgical infections. We try to prevent sepsis. So too is
the reason we concentrate on the most severe event is because the other least ambiguous. They are the least to know in certainty that they really are true events. They are the most serious. And they act as an anchor to help us work out one of the cause effect is for infections in general. That can lead us to the prison strategies. Should benefit everybody at large. Not only the deep silent infections but the surgical infections. Not only severe sepsis but mild sepsis. And likewise, we learn the lessons of what it takes to prevent severe pneumonia that should also overflow into the morgue mild pneumonia's as well.

The issue of be here is that it uses a metric. It's not a clinical type gnostic tool. The metric is designed and has a different mission from clinical diagnosis. The mission is ambiguous. The window into what is going on with patience and where the potentially problems live. Not to capture every single patient that does not have a condition. In order to -- what we do is give up on some of the [Indiscernible] in order to increase objectivity and reduced ability and seriousness of the event we would capture.

I understand and appreciate that it is collocated. It is I think the common thing for those for quality improvement, infection prevention, we are -- our bread and butter. To try to get population messages on how to improve things for everybody.

The other issue that has come up that there are opportunities for gaming. So the paper publishing group last year laid out a strategy for how you could gain all of your [Indiscernible]. This is the same patient we were looking at earlier. You can see he was high on the first aid -- first day and drop down. The patient does not have anything here and tell January 8 when the patient has a jump in the event settings of 28 and what these said was what if before the patient., Every single day, we increased by one point. Every other day, and you would make changes from five of 26. By doing so, [Indiscernible] change. However, it would eliminate the stable baseline last establish before. If you do this, you deliver each [Indiscernible] on a day-to-day basis. You will not get VAC. What is the problem? First of all, I would say that as we know, we are getting more and more oversight and regulatory agencies, health departments, joint commissions, CMF. And I think if they were to look inside your population and discovered this kind of that and delivered manipulation, that would be fraught.

That would be a problem area for you. But I think more deeply than that, this kind of behavior misses the whole point of what we are trying to do over here. It is to try to identify opportunities for improved patient care. I think that is why we are here. We want to make things better for our population. This metric has a potential to ring to your attention, your hospital's attention a population of patients suffering from [Indiscernible] complications to whom we have been blind to in the past.

Again -- by gaming, you have opportunities to discover patients with serious convocations who could up in a window to use to potentially
modify care leading to broad [Indiscernible]. I think this misses the point.

The other critique out there is all of these are preventable. Here is a study done out of washer. In each case, they did intensive evaluations to try to work out whether that particular VAE was preventable or not. They adjudicated 37% of VACs as potentially preventable. This is a half full kind of situation. Do you say we were able to discover an empty in which 47% of cases were preventable giving us new insights to improve populations. This is been a learning opportunity or do you say 67% were not preventable. A loss caused.

So I think that has to do with which interpretation is important -- appropriate. With the to decide if it is preventable or not is really tough. It may be because the patient aspirated. This is not preventable. But what if you have the patient off the ventilator three days earlier by early mobility, best practices? They would've gotten the opportunity to vomit on the ventilator in the first place. Maybe it was preventable.

I think judging prevent ability retrospectively is tough. Therefore, the best way to prevent it is to look at the emerging body of interventional studies that are demonstrating to us the AE. -- VAE. And that is what I would like to cover next.

The goal is preventing VAE and how do we get there.

There are two basic ways you can prevent VAE. The first is to decrease duration of mechanical ventilation. If the patient off the ventilator center. Therefore you risk -- you reduce risk. The other is to take the four conditions that most commonly cause this and target -- the best things to prevent is often associated with decreasing association with the chemical installations. This is a list of attentional strategies that I think need these two criteria. Minimize sedation, hair SATs and SBT's, early mobility, Potala volume ventilation, conservative fluid management and blood transfusions.

Michaud you saw the interventional studies done so far. Only a fraction have been formally evaluated at this point.

Back to our friends at the Canadian critical care. Temper best practices among his later patients. And you can see over here, [Indiscernible] components of the best practices they are trying to work on over this two-year period.

What you can see is that they were able to achieve modest improvement in a few things. Oro integration, mouthwash. The key thing is they did not approve things that much. The intervention is missing many things that I was saying one slide go. Despite the fact that it was a limited Delta in terms of improvement, they were still able to see a significant reduction in the rate talking about one third.

That was study number one. Of the at was the first glimpse that these are preventable through adoption of best practices.
This is a study that had lots of limitations. Nonetheless, put out there. The notion that these can be prevented.

The next study is more of a -- more rigorous giving us confidence. This is an and knowledge meant -- and analysis. 1/3 to 1/2 of these are caused by excess fluid. This is a randomized controlled trial and strategy to minimize Lewis patients were getting.

-- Fluids patients were getting. They checked on a daily basis called BMP. The be high -- they decrease the amount of fluid putting into the patient giving patients more diuretics and putting more fluids out to decrease load balance.

Patients who are randomized daily had more diuretics than were negative balance. Here we have a single study with a single individual where they measured 50% reduction. We haven't even begun to talk about implementing all of the other things I suggest my cause VAE as well. That she give you the appropriate grain of thought regarding that estimate. The bigger studies that thus far with AC/DC prevention wake up and breathe collaborative work perspective quality improvement collaborative with the goal is to prevent through less sedation and earlier liberation from the chemical -- mechanical ventilation. To adopt to this increase performance of their daily spontaneous awakening child and bringing trials. First waking up the patient bike stopping the sedatives. When the patient is off the city you -- said that, this is done with 12 in seven different hospitals. Here is what they found. They were not able to substantially increase SBT's. As well as the red line over there. That in turn, associated with an increase number of SBT's done with sedatives off there could be cut that almost up to 85%.

That was associated with a substantial decrease of rate. And a 65% decrease in the IVAC rate. It was also paralleled by very nice decreases in decrease in ICU length of stay, decrease event by 2 1/2 days. Overall, a positive studies. Suggesting to us and reaffirming what we have done on the approval care side which is that sedation is real pro longer. And it can't sedation management. Minimizing sedation is a potent strategy to get patients off the ventilator center and out of the hospital sooner.

If I could leave you with summary thoughts. I would like to argue that ventilator associated events is a patient safety opportunity. Because this new metric is bringing to light and a broader population of patients suffering from complications of the chemical fiddle a should. We know about the trigger to try to do something about it. And finally, we have a more objective metric to crack our program. We don't have to worry anymore that if we see a decrease in rates like in the old days that it might've been versus improved care. Now, we can see that we can be more confident that a decrease in rates actually does improve with care. I think these are critical and will allow us to take critical care forward. Thank you very much. I think we have a few minutes. I am happy to take questions.
Thank you very much. Can you give direction on opening lines and taking questions from the audience?

I sure can't. Ladies and gentlemen, to ask a question verbally, just use your race and icon located at the bottom of your participants panel. And we will call on you one at a time. You can also enter it into the check dental. In the bottom right-hand of your screen.

It looks like we have a question from Laurel. Go ahead. Is unmuted expect my question was answered your thank you. >> On their other people with questions? -- Are there people with questions?

We have a question from MS. Go ahead your line is unmuted.

I really have a question. I just wanted to say that you had a wonderful presentation and I appreciate you teaching us.

It is my pleasure. Thank you. I appreciate you saying that you expect --.

Any other questions or comments?

This is Jamie Moran. Have you had any feedback from the new surveillance definitions other than what you have addressed already about how well it's being received? Are infectious preventions at the front lines fighting it easier to follow? Or are they more kind of distracted by the fact that there are some the new definitions coming out Rex

Am not aware of any systematic evaluation. I simply have the anecdotal comments. And to be frank with you, it's a mixed bag. I think that many feel that this is much more objective. That may have made life a bit easier. I think that many when they first start [Indiscernible] these events, they are overwhelmed by the many different tears, there any product -- new antibiotic criteria. That takes time to get used to. But I think once people get over that hump, it turns out to be more manageable.

Those hospitals that have been able to automate that's a balance our particularly happy -- are particularly happy. I know that lots of hospitals note that the infection prevention department, they generate the rates. ASQ -- the air not sure what to do about it. They are not sure how to share with our colleagues. They are not clear how to give good advice about prevention. And so I think that that is very uncomfortable for people. And I think what we are trying to do is hold up the evidence-based and evidence materials that we can help people to make that conversation be more and more direct productive. But these are new definitions and it's taking a little time to do that. So we look -- I appreciate that. Over 2000 hospitals report data to them. So we do know they are on a national level.

Thank you.
We have a question from Ace.

I was wondering if there is a commercial application that is available for reporting or collecting this data? Or if most facilities are custom building in their EMR. As a calling, we be making your presentation available to those of us who would like a copy?

I believe the presentation is being circulated by the organizing Authority. Is that right?

Yes. We do have your presentation. It will be posted on our website. It did go out to all registrants today. Or yesterday.

Okay. And I think with regard to formation software, there are a few things moving in this space. And I do know that epic has part of their 2015 infection control module. It does have a VAE detection or at least the back level. I do not believe that their ducks hasn't yet. But they will have it at some point. And CDC themselves is -- has a pilot version of a web-based tool that hospitals can use for population patience and it will spit back to them which patients have VAC and IVAC. If the hospital is giving that a try, they can be in touch with CDC an BA pilot data for that. That is in terms of the widely available tools that you allude to. Many hospitals are humbled in systems to do that.

That aside, if you are a hospital humbled, you might want to get in touch with CDC. Because they do have that training data set that you can use to match your [Indiscernible] to make sure it's doing correct identification. -- Phoenicia. If you get down to the week definition, there are five points and you want to make sure that your program is -- if you are going at route I do encourage you to be in touch with CDC.

>> Ice number questions at this time.

Dr., this is Martha. I have a question about Heidi a strike or have suggestions about striking a balance between trying to reduce ventilator days and having that risk of ex-abating or taking someone the -- off the ventilator to early.

If you're knocking out all of the sedation, the patient is going to get agitated. To send. With adult populations, and this does not apply to kids, with that out populations, in the randomized controlled trial of sedation minimization, they do observe an increase in the self extubation rate but not an increase in the reactivation rate. In other words, the patient themselves ask debate and seem to be able to fly just fine out there. By and large. And so, one of my mentors taught me those patients are telling us that they were ready to be extubated before we thought they were work but it does not tend to be a safety problem by and large. With self extubation's. >> Thank you. Are there any other questions?

We have one. You allude to the fact that a lot of things I am recommending are going to decrease mechanical ventilation. Decreasing the average number of ventilator a day, and the population level, the decrease into later that counts. So if you are reporting your rates
using 1000 ventilators as a nominator, you might see a paradox of increasing your rates because you have shrunk the size of the denominator. This margin nominator, higher rate. The same thing we see with [Indiscernible] associated UTIs. Increasing your UTI rate because of the denominator.

Because of that problem, CDC is well aware of that issue. And they therefore have created the option for you to use the 100 episodes of the denominator in addition to the 1000 ventilator that day. That takes away the shrinking denominator. So my strong advice is that if your improvement package for your patient inquiries -- includes [Indiscernible] you would want to look at your rates per 100 episodes instead of 1000 ventilator days to make sure you are actually seeing the impact of your good work.

Thank you Dr. Campos. We just identified that we have several questions in chat that we were unaware of. We are running out of time. If you are willing to stay a few minutes, we could go through some of these. And they will be captured on our archive, correct? They will be on the close captions. When question is when do you think there will be benchmarks for UAE.

I don't -- the onset, I think the intention of being together with two years surveillance data and published its marks. Of that is still the case, I cannot speak for them. Resume of Lee, we would see benchmark data this year or next year. In the interim, which it can do is to get literature on the seven or eight different studies on the surveillance out there. And you can see what kind of rates people have been reporting. Either way, there is a way to get [Indiscernible] out there.

Thank you. I am not sure I said your name correctly. Seattle medical at Harborview is wondering if there are questions regarding the prevention of VENT and long-term patients not [Indiscernible] from the event. Which is difficult in the long term. They do [Indiscernible] and are there other things that can be done for this population?

There is a tremendous question and a complete area with the knowledge [Indiscernible]. We know little of nothing. We know nothing about VAE surveillance and long-term patients. We don't know anything about the incident or risk doctors. That is a real hall in our knowledge area.

I think that is all the questions we had in chat. We are slightly past the top of the hour. I do apologize for hitting is out late here we thank you so much Dr. Klompas Dr. Has always, we request you complete the survey monkey. There is a URL on this like currently. You also be directed to the site and you log out of the event center. As was mentioned, this presentation was recorded. And this will be posted on the Wallace help website. That, I think everyone and we will close the session.

Thank you.
Thank you Dr.

My pleasure. [ Event concluded ]