Inpatient Quality Reporting Program

Support Contractor

Hospital Value-Based Purchasing Program

Presentation Minutes

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Mike Seckman: This is Conference # 98929833.

Good day and welcome to [the] Value-Based Purchasing Improvement Series – Healthcare Associated Infections and CDC. My name is Mike Seckman and I'll be your technical virtual host for today.

All of the audio for today is being streamed over your computer, so please turn your computer speakers or up or plug in a headphone, whichever you need to listen to. We do not have the ability to unmute people, so please don't raise your hand. We can't allow you to be able to communicate audibly. The way we will allow you to communicate with our presenters, if

you do have any comments or any questions, is in the lower left-hand corner of your screen you'll see a chat panel and it will say "Chat with Presenters." You can go ahead and enter your information in there. Enter your question or your comment and then send it. Please send it to all panelists. That way everybody can see it and everybody has a chance to answer it. We – with this WebEx session, we do not have the ability for all of the attendees to see the questions that everybody else is asking. However, if it's an important question that pertains to everybody else, we will broadcast that question and the answer to everybody else.

So, with our housekeeping out of the way, I would like to introduce Bethany Wheeler. Bethany, the floor is yours.

Bethany Wheeler: Thank you. Hello and welcome to the – to our Hospital Value-Based Purchasing Program monthly webinar. Like Mike said, my name is Bethany Wheeler. I am the lead of the Hospital Value-Based Purchasing program with the VIQR Support Contractor and I will be your host for today's event.

Before we begin, I'd like to make a few announcements. This program is being recorded. A transcript of the presentation, along with the Qs&As, will be posted to our Inpatient website, www.qualityreportingcenter.com. Again, that's www.qualityreportingcenter.com, and that is all one word. It will be available within two days and will be posted at *QualityNet* at a later date.

If you registered for this event, a reminder email, as well as the slides, were sent out to your email one or two hours ago. If you didn't receive the email, you can download the slides at our new Inpatient website. Again, that's the www.qualityreportingcenter.com.

Today, we are happy to welcome three groups of guest presenters: Maggie Dudeck from the Centers for Disease Control and Prevention will present how CDC calculates the CLABSI and CAUTI measures; and then we have two hospitals that will present their improvement choice for the CLABSI measure. Because we have multiple groups of presenters today, I ask if you have a specific question for one of the groups that you either put the group's name, either CDC, Lake Regional Hospital or OHSU, or the presenter's name at the beginning of the question.

We have a packed agenda today. So, without further hesitation, I would like to introduce our first presenter, Maggie Dudeck. Maggie Dudeck is an epidemiologist for the NHSN Methods and Analytics Team and the Division of Healthcare Quality Promotion at CDC. Maggie began her career with CDC in 2003 working as a graduate student with DHQP on the NNIS system, and eventually, NHSN. She currently has a central role in NHSN data cleaning and HAI analytic activities. She provides direct user support and documentation with a focus on analysis and interpretation of data and has served as the lead author or co-authored several national-level HAI

annual reports. She provides subject matter expertise to NHSN development analyst activities and to interagency working groups, and provides training to various groups around the country. Maggie earned her Bachelor of Science degree from Northern Illinois University and her Masters of Public Health in Epidemiology from Emory University.

As a reminder, any question you have for Maggie, please either type "Maggie" or "CDC" at the beginning of your question. Maggie, the floor is yours.

Maggie Dudeck: Thank you, Bethany, and thank you all for joining today. It is a pleasure for me to be able to talk to you all about the methods behind calculating standardized infection ratios for CLABSI and CAUTI data.

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So I wanted to first introduce the concept of the standardized infection ratio for those that may be left familiar with this type of measurement of data. The standardized infection ratio is a ratio of the number of observed or identified HAIs of a given type divided by the number that are expected, or rather predicted of HAIs of that same type. So essentially, what this means is the number of observed, those would be the number identified and reported to CDC's NHSN and the number that are expected or predicted. This comes from the national baseline data in addition to the amount of exposure seen in your hospital. And I'll show you what that means related to CLABSI and CAUTI. Calculating the number of expected infections can differ depending on the measure. But today, we are focusing on CLABSI data and CAUTI data, and for those two HAIs, the method is the same.

So what I'm about to show you really describes the methods used behind the scenes in the NHSN application. So there isn't an expectation that your hospital would ever have to calculate these on your own. This is what we do for you, but it's important that you have an understanding of how we go about doing this so you know what sort of changes may impact your SIRs.

Next slide.

So, for CLABSI and CAUTI data we calculate the expected number of HAIs first at the individual location or unit level, and this is calculated by taking the number of device days that your hospital had reported for a given period of time multiplied by the NHSN pooled mean divided by 1,000. Now, of course, the device days would be specific to the HAI type. So if we're talking about CLABSI, we would use the number of central line days reported for that unit and time period.

Now, the pooled mean here is one that originates from a defined baseline report or a baseline time period. The baseline remains static and

consistent. This allows us to measure progress at a national level towards a particular goal. Most recently what had been used was goals as part of the HHS action plan to prevent HAIs.

So for CAUTI data for acute care hospitals, we used 2009 data reported to NHSN that were published in 2011, and for CLABSIs we used data reported during the time period of 2006 to 2008, published in 2009. We do have different baselines for LTACHs and IRFs. That's not the focus of today's presentation, but I did want to include this here, especially if you are an acute care hospital that may have an inpatient rehab facility unit. Those do have updated baseline data.

Next slide.

So this is a screenshot of the data reported for CAUTI in the baseline report. So this is a 2009 pooled mean. You can see here, this is for a burn critical care unit in the screenshot. And at the national level, we had 92 CAUTIs identified and 20 – over 20,000 urinary catheter days, and this gave us a pooled mean of 4.4. What this means for us is that we can say there were 4.4 CAUTIs per 1,000 urinary catheter days during the year 2009 that were reported to NHSN for burn critical care units specifically. Again, we used this 4.4 as the baseline, and that is to say that we predict that for every 1,000 catheter days we will see 4.4 infections if things were exactly the same as they were in 2009.

Next slide.

Earlier, I had mentioned that we first calculate the number of expected infections by individual unit level first. This is an example, a table showing four different types of ICUs. We have a Medical ICU, Surgical ICU, a Medical-Surgical ICU and Cardiothoracic ICU. Now, the reason we do this is because the pooled mean, of course, are different for each type of unit because each unit represents different types of patients. These patients are considered to be similar in their risk for infection, perhaps in the device used, and need for device. And so, we want to make sure that in order to get an appropriate summarized risk-adjusted measure that we calculate the number of expected by unit level first. So using the example of the Medical ICU, which is the first row in the data table here, the number of expected infections, for whatever time period this represents, is calculated first as taking 3,284 urinary catheter days multiplied by the pooled mean, which is 2.3, divided by 1,000. So for this one unit, we predict 7.55 CAUTIs in the Medical ICU.

Next slide.

So, what we've done here, and you saw this on the previous slide as well, is we have the total number of expected first for each unit. Then, what we do

is we can summarize all levels of the data here. Well, we have the total infection count. We have the total number of expected. We can even total up the urinary catheter days. However, even though we have the total number of infections and the total catheter days, an overall rate should not be calculated. If we were to calculate an overall rate for these four very different types of critical care units, we would be assuming that they're all the same, and we know that's not the case, and that's why [we] went through the process of calculating the expected by location.

Next slide.

So what we can do is, we total up the infection count. We total up the number of expected. And the screenshot I'm showing you at the bottom is actually an example output from the NHSN application. So, for those hospitals reporting their data to NHSN, you can obtain this information in a (canned) report overall for your hospital. So across this four ICUs, what we have is, we identified 24 infections and we predicted 24.96 to occur.

Next slide.

I just wanted to provide you another illustration of how we sum up these data because we often get questions from hospitals about whether or not it's appropriate even to calculate an overall SIR for a particular HAI type. And the answer is yes, and that's in fact, what we do at a national level. If we were to look at this data nationally, we would sum up the number of infections across different units and divide that by the number of expected for each individual unit.

Here, this is showing the overall SIR for four different ICUs. So you can see each ICU data observed is added up for an overall and we divide that by the number of expected that is summed across. When we take the total number observed divide that by the total expected, that is what gives us the SIR for this group of locations.

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So, with that being said, we do not add up the individual SIRs for each individual unit, okay? So, that SIR of 0.96 really is 24 total infections divided by 24.96 expected, then we get our SIR of 0.96. Now, along with the SIRs, within our application, within NHSN, we do provide a p-value and a 95 percent confidence interval. The focus for today, however, will be the 95 percent confidence interval, and that's because when we submit data from CDC to CMS for each quarter, we submit the 95 percent confidence interval and the interpretation, whether the hospital is better than, equal to, or worse than the national benchmark of 1.

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So trying to get into layman's terms here for a 95 percent confidence interval, it is an interval for [which] we have a high degree of confidence that it contains the true SIR. And the reason we say this is because technically what we are calculating for you is an estimate, right? Because when the baseline data are calculated, that is an estimate of the national experience. The confidence interval, of course, includes two numbers, [a] lower limit and an upper limit, and when we look at those two numbers, we can use that information not only to determine the significance of the SIR but also the precision of the SIR. So, that is to say that if our confidence interval includes a value of 1, the SIR is not significant. What [that] means is, we would say your hospital's data is no different than the national baseline data. You can also review this as if the lower bound is less than or equal to 1 and the upper bound is greater than or equal to 1; then the SIR is not significant.

Next slide.

This is just an illustration showing you some made up intervals, confidence intervals, and sometimes the best way to review the confidence interval is maybe just to draw it out on a graph. So the top two lines represent two confidence intervals where the hospital's SIR is the black box in the middle of the line. We have that value of 1 kind of as a boundary. The top two are not statistically – excuse me – statistically significant because the lower bounds are less than 1 and the upper bounds are both greater than 1, but when we look at the two – the two intervals drawn below, they are statistically significant. The first green line, both limits of the confidence interval are greater than 1, and for the last one, they're both less than 1.

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So I think one of the most important things that I want you to get out of this understanding of a SIR is, not only is it a summary measure, but it is a risk-adjusted summary measure, okay? So this is not the equivalent of – it's not the equivalent of looking at, you know, a pooled rate for all different types of units in your hospital. It really is a way for us to risk-adjust using the types of patients that you were seeing in your hospital and providing you with one overall measure. Of course, each SIR can be calculated at different levels.

Today, we showed you a CAUTI SIR for all ICUs combined. You could look at a CAUTI SIR for all units for which your hospital may have been reporting data. Another example I have here is for *C. difficile*. We can calculate a SIR for all hospitals in a particular state or even at the national level.

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One thing that I do want to point out is that there is a caveat to calculating the SIR as it relates to the number of expected infections, and that is if we

predict or expect less than 1 infection and NHSN does not calculate a SIR. And the reason is actually two fold.: one is to enforce a minimum precision criterion, and that is to say if we don't even predict one infection, perhaps there is not an exposure or not enough patients at risk for that type of infection for us to even predict one to occur, or perhaps it is a type of infection that is considered to be of low occurrence or low incidence. We also do this to help aid an interpretation of the results. So, let's say a hospital observed two CAUTIs for a given time period, but NHSN estimates that 0.5 were expected. If we were to calculate the SIR, it would be 4, and this can even be interpreted as saying it's four times the number of infections expected, yet only two were identified, and that can sometimes be hard to interpret. So, some hospitals, actually many hospitals, may run across this when looking at data for short amounts of time, like let's say, a quarter's worth of data. However, when looking at data over one year, they may be more likely to see at least one expected infection.

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I did want to point out just a couple of things about interpreting the SIR. Again, it is a ratio. So if the value of this is 1, then we're saying that the observed number of events is equal to the expected number of events, or rather, there is no difference in what you've identified compared to what we would expect given the national data. If your SIR is greater than 1, that means you have more infections that you've identified than we would expect. One example here is a SIR of 1.25. You could actually interpret that as saying 25 percent more infections than expected. And of course, if the SIR is less than 1, that means that you had actually identified fewer infections than would be expected based on the types of patients receiving carrier hospital and the national baseline experience. So a SIR of 0.5 could be interpreted as 50 percent fewer infections than expected.

Next slide.

And actually, I think I had just duplicated this slide here, so we'll go on to the next one. I just wanted to provide you with the references to the current baseline reports that we are using for calculating the SIRs for CLABSI and CAUTI. These are also available on the NHSN data and statistics page, but here are the references directly for your use if you're interested in knowing the pooled means NHSN is using for each one of your units.

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Of course, I wanted to provide you with some additional resources. First and foremost is, we have a page on the NHSN website dedicated to all of the CMS resources for reporting HAI measures. So that includes operational guidance, helpful tips for making sure your hospital is compliant and complete with reporting for the quarter for every measure, and even

some guidance on how to analyze the data that will be submitted to CMS and how to see if there are any issues in completion of those data.

We have more analysis resources. What (I had) covered today is really just scratching the surface with the SIR. If you've viewed any of our previous NHSN trainings, you know that I could probably go on talking about this for at least two hours. So considering we don't have that time today, I did just scratch the surface. But I encourage you all, if you're more interested or if you're interested in understanding more about this measure, please be sure to visit our website. Look at the resources we have available. We will soon be posting some live trainings that were recorded in February of this year. Those will soon be up on our website in the coming weeks. And of course, if you have any NHSN-related questions, we have the NHSN help desk email here.

So thank you all for your attention, and I'm going to pass this back over to Bethany.

Bethany Wheeler: Thank you, Maggie. That was an excellent presentation. I sure learned a lot myself. Our next two presentations will be provided by our two guest hospitals. The first presentation, provided by Lake Regional Health System, will be given by Dan Sabourin, the Director of Education at the Resource Center/Occupational Health and Safety.

Lake Regional Health System is a 99-bed rural hospital in Missouri. They improved from the baseline period in FY 2015 from 3 actual infection, 2.38 predicted infections, and SIR of 1.261 through a performance period with no infection, 2.198 predicted infections, and a SIR of 0.

If you have a question regarding this presentation, please [indicate] Lake Regional or Dan at the beginning of your question. Welcome, Dan, from Lake Regional Health System. The floor is now yours.

Dan Sabourin: Thank you for having me as a guest today. Just to start off, just to show you picture of [the] front of our hospital there.

So, next slide, please.

And I'd also like to just give you a little information about the hospital so you can kind of compare it to your facility. As Bethany said, we're right at the 100-bed acute care facility. We also have a 16-bed skilled nursing facility. Average daily census is about 66. So, we are accredited by The Joint Commission, and we are a three-time recipient of the Missouri Quality Award. And if you haven't applied for your own state quality award yet, I encourage you to do so. We provide inpatient and outpatient services here. We have a 35-bed level III trauma center. Our emergency department gets very busy, particularly in the summer months, and we have approximately

34,000 visits each year. We also feature an 18-bed medical/surgical Intensive Care/Cardiac Care Unit. So for the purposes of today's presentation, we have one ICU in our facility, and we have a 22-bed stepdown unit. Some of our surgical services include general surgery, CV surgery, ENT, orthopedics, gynecology and urology.

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I want to tell you just a brief update on the Lake of the Ozarks. It's a vacation and retirement destination for people from many Midwest cities, resulting in seasonal variations in hospital census. So our community has grown over the years, and so has our hospital, to meet the needs of the community. That's a very small map of the lake, but it is a large lake. The main channel is 100 miles long and there are over 1,000 miles of shore line.

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I wanted to give you some basics about our ICU CLABSI data; and this was collected from 2009 through 2014. The greatest number of CLABSI that we encountered during this timeframe was two in one month. That happened one time in June of 2009. So every other data spike that you see in the data that I'm going to present only represents one CLABSI in one month. And the central line days, remember we have just one ICU, and they range from 83 to 252 per month.

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Now, this graph, what we did was we represented our CLABSI rate as the number of CLABSIs that we incurred divided by the number of central line days times 100, and that's on your Y axis, the vertical axis. On the X axis, the horizontal axis, we illustrated a monthly data point for this six-year period from 2009 to 2014, and this really helped us to show everyone the volatility that we experienced when we first started to attack this problem. It took us a little over two and half years to make a dent. So we see a lot of that in the beginning from 2009 into 2010, a little bit into 2011. You're seeing a lot of ups and downs. And then we have this wonderful streak of 41 straight months where we did not have a single CLABSI in our ICU. It was almost three and a half years.

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So this is really the good stuff. This is kind of the implementation steps of how we were able to reduce our CLABSI over time. We started out – if you can see the orange check marks going down, those were some of the steps that we took. In 2009 we upgraded our CVC dressing change kits. There was a little bit of cost involved in that. If you'd like to know what's in those kits, I can provide that information later. And then, in February, we

implemented the CVC Checklist and we introduced some education on that. Now, in March of 2010, we used the checklist for the very first time. So that was kind of an exciting day for us. And then, in October of 2010, you can see that I bolded the fact that the usage of the checklist needed to be reinforced annually and as needed. It was kind of a culture change for us, and now, it has just become part of what we do. And then, in January of 2011, we introduced a mandatory CLABSI prevention PowerPoint education piece for our staff. I made sure that everyone had an opportunity to ask questions after they received the education. Then in May 2011 we presented our Infection Control Committee with [a] CLABSI prevention timeline, and for us, that was just a way to map out what our implementation steps were going to be and how long we thought it would take to get them infused into our culture. In July of 2011 we introduced [the] CLABSI Prevention Champion in our ICU, and later on I'll kind of give you some information on what that person's duties are.

In July of 2012, we considered the purchase of some CVC Start Carts, a rather expensive purchase. So we got through that process. In October of 2012, we upgraded our CVC Start Kits, and there was a pretty good chunk of change involved in that, as well. And if you'd like to see what went in those kits, like the antimicrobial properties, the CHG, some other things, I can present that for you later, as well.

Now, in August of 2013, we checked the progress of our previous implementation steps. It's part of our process improvement here at Lake Regional. In August of 2014, we added our mandatory CLABSI prevention education into our online education system. So that made it more accessible for folks to get the education that they needed. And finally, in September of 2014, we approved the purchase of those CVC Start Carts, and they arrived at the hospital, and now, we use them throughout the facility whenever we insert a central line.

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Now, this is a repeat of the slide that I had earlier, but what it shows you is each one of those orange check marks indicates one of those implementation steps, and what we found interesting about this is, sometimes we would have an implementation step go into place right after we saw a spike in our data. Other times, we would implement changes just based on the usual process of trying to make a change in a hospital. And then you'll notice that during our streak where we didn't have any central line infections, we continue to implement steps to prevent CLABSI from occurring in our ICU in the future.

Next slide please.

This is an example of our CVC Checklist that we use in our hospital. I'm sure you have a very similar checklist where you work. We made some updates to it and some minor changes as things would come about; new recommendations as such, and then put that back out onto the floor to be used for every insertion.

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And our CLABSI Prevention Champion, this person really made a big difference because they acted as a mentor and an educator right at the bedside. They would do spot checks and monitor for consistent practice. They provided progress reports to the staff so they got that immediate feedback. And also they helped to spearhead implementation steps, so when we wanted to try something new, they were right there to help us do that. And it's kind of interesting to celebrate 0 percent, but we were proud to be zero for those 41 months. We did have another CLABSI in December of 2014, so 41 months is our streak that we're going to try to beat on our next round.

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Now, this is what we call our future implementation steps, our wish list, where we try to ask Finance if we can have funding to make some more implementation steps. We hope to introduce CVC port caps with alcohol inside them. That's going to cost a considerable amount of money, but I think it's a step that is getting closer and closer to becoming a national recommendation. And also, we're looking into data mining software. It's a very expensive change for us, but it would really improve our efficiency, not just for collection [of] data on CLABSI, but other infection prevention initiatives. And to the left of that, you can see – that's our CVC Start Cart. We have six [of] our seven of those now, and we use those outside the ICU so that we can kind of maintain that same standard of care. You have a nice clean work surface for the person putting in the central line, and the drawers hold everything you need that are listed on the checklist so you don't have to leave the room and come back in and out of the room to provide everyone with the personal protective equipment that's needed.

And it's – that's the conclusion of my section. I'm going to go ahead and turn it back over to Bethany.

Bethany Wheeler: Thank you for sharing your story, Dan.

Dan Sabourin: Thank you.

Bethany Wheeler: Remember, if you have any questions for Dan, please, you can add "Lake Regional" or "Dan" at the beginning of your question, and we will try [to get it answered.]

Our last presentation for this webinar would be provided by Oregon Health & Science University, or OHSU for short. OHSU is a 560- bed urban hospital in Portland, Oregon. The hospital improved in the fiscal year 2015 VBP program from the baseline period with 21 actual infections, 43.912 predicted infections, and a SIR of 0.478 in the performance period with five actual infections, 46.092 predicted infections, with a SIR of 0.108.

Without further hesitation, I would like to introduce the presenters from OHSU; Ellen Adrian is the Nurse Manager of the IV Therapy PICC team; Brenda Quint Gaebel is the Equality Specialist; Lori Ellingson is the Division Director of Surgical and Oncological Services; and Robin Roach is the Manager of Infection Prevention and Control.

As a reminder, if you have a question for this group of presenters, please add OHSU to the beginning of your question. OHSU, the floor is yours.

Female: Good morning. A little about OHSU besides what was previously mentioned: it is the state's only academic health center and our hospital and clinic serve a quarter of a million patients per year. From our humble beginnings back in 1887, OHSU has grown to a world-class teaching hospital and research center. Our licensed [number of] beds is actually 576. We have 543 staffed beds and 145 of those are pediatric patients. We are a trauma I center. We have a transplant program of solid organs. We also have a large oncology patient population, including bone marrow transplants where we did, just last year, over 220 bone marrow transplants. We have over 14,000 employees throughout our system, and we are proud to say that we have been Magnet-recognized since year 2012.

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And again, this is just who is on our team to present today. We really feel like it's a whole team approach at OHSU, and these are just a couple of the key players that were involved in some of our work [over] the many years. There are many more, obviously, that have assisted in this process.

Next slide.

So the data that we have regarding our CLABSI rates of 2014, I have it on – documented on this slide, that overall, for the four ICUs that are in our adult inpatient population of the ICUs, we have a total rate of 7, which includes 3 from the medical ICU, 2 cardiovascular ICU, 0 for trauma/surgical ICU, and the neurosurgical ICU has 2. As you can see, our rates are on the slide, which gives us a SIR rate of, total for the organization, 0.236. So, all better than the national experience individual, except for our neurosurgical ICU, which is no different than the national experience and not statistically significant.

Next slide please.

I'm going to turn it over to Brenda that will talk about this slide.

Brenda Quint Gaebel: So as we embarked on our CLABSI reduction work. We wanted to engage our staff, and we found the best way to do this was to share more information about CLABSI. We showed how we contributed to the national rates. There was information out about what the financial costs are to the patient related to the infections, and we used 2007 U.S. dollars. We saw that in 2010 we had 47 CLABSIs, and by July of 2012, we'd gone up to 63. We took the number of the range of $7,000 to $29,000 estimated cost per infection, and we applied our numbers of infections to this number, and that's the graph on the right side. You can see how we were going up from 2011 to 2012. We also wanted our staff to understand the other types of costs, such as [how] increasing antibiotic use contributes to additional complication. There's also cost to the family and to the patient's ability to be functional and a potential of up to 25 percent of our patients with CLABSI dying.

Next slide please.

This chart shows our numbers of "rate per line days" over the 2009 to 2014 time period with the interventions that we made. Starting with 2009, the reporting of the infections by unit to the unit managers – [in] 2010 we added the checklist implementation. We did the mandatory training for our central line placements. We added CHG bathing and we also changed how we were culturing the infections, changing from the central line through a peripheral stick. In 2011, we added device utilization information for the units. In 2010, we actually did a rapid improvement plan, and by 2013, we had a CLABSI Prevention Committee, and we were doing real time case notifications to the care units. And just last year, we did more with the Kaizen work and multi-disciplinary case reviews. And all of these items, we will be discussing further in our presentation.

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Another way that we wanted to share information about our CLABSI rates was by breaking the infections down by line type. We showed the number of cases that we were having CLABSIs related to the number of patients with these lines and then also, by line days. We also wanted to identify where in the time the patient had the line that the infections were being identified. We used the time period of less than or equal to five days as being most likely related to the insertion of the line, and then, after 14 days, being most likely related to the maintenance. You can see that we have a high number of placements for internal jugular, and with the rate of six percent of our patients – 6.6 percent of our patients getting infections, or by based on line days, 0.84 per 1,000 line days. As you can see, PICC lines,

we did 2,700 lines, 58 or 2.1 percent of those patients developed CLABSIs, or 1.02 per line day.

And I will now turn it over to Ellen who will explain how we address the PICC lines.

Ellen Adrian: Hi, this is Ellen. I'm the Manager of the IV Therapy PICC Team, and when we looked at this data, we realized that PICCs were a predominant type of central venous catheter that were being placed on our patients.

Next slide please. I'm sorry.

So, in regard to central line days, so we focus on [the] PICC team a bit. At OHSU we have had a dedicated vascular access team in place since the 1990s. Our team currently places anywhere from 200 to 250 PICC lines per month in the neonatal through the adult patient population. We have responsibility for the maintenance and care [of] about [number] PICC lines in house and service of vascular access consult service for all issues regarding vascular access.

The 2011 CVC guidelines for the prevention of intravascular catheter-related infections know that specialized vascular access teams have shown an equivocal effectiveness in reducing the incidence of the CLABSI-associated complications and cost. Even as far back as 1999, our PICC team implemented the use of ultrasound guidance for all PICC line placements. This helped us to achieve a really good success rate at first-attempt PICC placement which grows from 80 percent to 99 percent. Using real-time ultrasound guidance allows the catheter to be placed in larger veins of the upper arm, away from the point of flexion in the elbow, decreasing thrombophlebitis, and is also decreasing the risk of CLABSI.

In 2007, we designed a custom max-barrier kit for all PICC line placements which contains all the supplies necessary to achieve maximum (sterile) barrier precautions. In 2008, we implemented standardized documentation for all our procedures; and in 2012, a PICC team implemented an assisted PICC insertion as standard practice, and we had no standardize workflow to ensure that this was (an assistant) for each sterile procedure.

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In early 2013, the team was provided with reports on insertional data for all CVCs. We were able to track and follow-up on CLABSIs that may have occurred at insertion. This has allowed us to implement specific strategies to reduce insertionally-related CLABSIs. One strategy we implemented was standardizing tip placement by using a tip navigation system. By using ECG technology, we have increased our ability to place the line in the

proper tip location, minimizing post insertional adjustments and reducing unnecessary exposure of the site.

Another strategy that we have implemented was using chlorhexidine-impregnated wipes to (bathe) the arm prior to prepping with a CHG antisepsis before draping. We also standardized the CVC/PICC dressing change kit to have all the required elements of the dressing in one sterile package, including hand sanitizer, face mask and large sterile drape for under the arm.

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Over the past two years, we have also implemented some really exciting noble approaches to CLABSI prevention that are showing some promising results. One of these was applying a product called Stat Seal on all new insertions. Stat Seal is made of potassium ferrate in a hydrophyllic polymer that helps stop bleeding and oozing at the insertion site. This helps keep the insertion dry and intact, minimizing dressing disruptions and changes. Dressing disruptions are a major risk factor for catheter-related infection.

So previously to implementing the Stat Seal, we were changing our PICC line dressings almost all of the time at 48 hours because of oozing and bleeding at the site. But since we started using Stat Seal, our 48-hour dressing changes have dropped about 19 percent. This year, we just got finished trialing a really new (noble) midline extended dwell catheter for patients that have difficulty in its access who need IV solutions for greater than six days but do not need central venous access necessarily. So far, outcomes for the use of this catheter have been really positive. During our trial, we placed 50 midline catheters and 14 of these we identified would have been PICC line insertions. So we feel like we were able to decrease some unnecessary central line placements.

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An important – another important part of our CLABSI prevention strategy is education. The vascular access team offers quarterly IV and CVC care and maintenance classes for all nursing staff at the hospital who care for patients with CVCs. In this class, CLABSI prevention strategies and OHSU policy in regard to care and maintenance is really emphasized.

The LCARE Bundle is – we introduced this in 2012 as part of that CLABSI prevention project and [it] focuses on the five elements of: limiting the number of times the line is accessed; checking the line necessity daily; checking for patency and notifying the vascular access unit that looks sluggish so that they can assess and follow-up; emphasizes aseptic technique which should be used always, hand hygiene, scrubbing the hub for 15 seconds; replacing infusion equipment line per policy; and we also

focus on eliminating contaminated blood cultures by using proper sampling technique. Every six months, we do a point prevalence survey, which is conducted by an independent party that looks at all CVCs and all patient carriers at OHSU and gives us kind of a snapshot for that day. What we look for, specifically, are a few different elements of the dressing itself. We look at: is it dry and intact; is there a BIOPATCH present; is the BIOPATCH placed for maximum efficacy; is it dated; and is hand hygiene performed all the time? Results from the survey are compiled and presented to the nurse managers and PPLs so that educational needs can be focused around gaps that we found during the survey.

The vascular Access Team, also in collaboration with our Shared Governance Professional Development Council, developed what we call IV Therapy Tips of the Month. These are flyers that we distribute to the nursing staff on a periodic basis. These tips help us to emphasize and reinforce to the staff proper line care and maintenance of all vascular access devices.

I will now turn it back over the Brenda so she can talk about – a little bit about some of the anesthesiology interventions.

Brenda Quint Gaebel: Next slide. No. This is the right slide. Thank you.

So, anesthesiology recognized that they were placing a lot of the lines and [large] numbers of these were becoming infected. So you can look on the chart on the right side. The black is our 2009 numbers and the white is the results of the CLABSI bundle. So we started the CLABSI bundle and also the central line kits that included the items that were needed for the line placement, including drapes.

We also, of course, included the proper hand hygiene, maximum barrier precautions, chlorhexidine skin prep, also optimizing the site selection and then the daily review of lines for necessity, especially up in the ICUs, so we could get the lines out in a more timely manner. We also separated the central lines from Foley placements. We added a hand sanitizer to the anesthesia carts, and the anesthesiology central line policy included the bundle. One of the things that we found most helpful was, by providing a notification to the team that placed the line that became infected, we also included audits of the bundle compliance in the OR. And one of the concerns that the anesthesia providers had before starting the bundle was that it would increase the anesthesia to ready time, and we used the data in our electronic health record and found that it did not increase the placement or the anesthesia start time. So that relieved a lot of concerns.

I am now going to turn it over to Lori to provide more information about our work.

Lori Ellingson: Okay, so we developed the CLABSI prevention Committee in March of 2013. The membership is on the slide there, but we really try to make it kind of, a not only [an] interdisciplinary nursing group, but included our MD Critical Care Director ad hoc as a member. The purpose is to review all CLABSI cases and make recommendations for improvements in practice related to the case review findings. The committee has gone through transition as far as first working at the standardized checklist and assuring that we have appropriate observation processes during insertion, and then also, that patient education around central line placement was documented.

So, the next slide please.

The recommendations that have come out of this committee are both interdisciplinary and nursing, including on the interdisciplinary side, central line checklist compliance, patient education, completion and documentation of central lines, and we also, out of the medical acute care unit, had a case of a CLABSI related to an elicit injection, and a creation of a policy and procedure came out of that case review.

So, some of the interventions have already been mentioned, but we have done nursing education on care and maintenance; CHG bathing for all patients with central lines, and this extends outside of the ICU to all of our other acute care and pediatric units; standardization of practice related to flushing; looking at our TPA use; BIOPATCH application; and valve changes. The prevalence study was previously mentioned, and we also are doing an R.N. peer-to-peer audit of central line maintenance.

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So this is just a picture of our central line audit tool. This was actually started – it got its origins in the pediatric ICU, and we've adapted it a little bit. We also have [a] professional goal of all of our nurses to provide peer feedback on a regular basis, and this kind of helps meet that goal with having a peer audit their practice and give them feedback.

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The last part of this is that every time there is a CLABSI – and as I said this is not just for the critical care setting but any occurrence that we would have throughout the organization – a review form is sent to the manager and professional practice leader of that unit, and then they use this tool to review the documentation review with the staff about essentially the experience of that line, and then they come to that prevention meeting to discuss that.

I'll now turn it over to Robin.

Next slide please.

Robin Roach: Hello. Maintaining our success is a challenge that we all face. Typically, interventions begin on a few units and expand to other units once successful. We undertook, in the fall of 2013, a broad approach to preventing healthcare-associated infections, a Kaizen event that included a patient in 21 representatives from the caregiving teams. The patient stories and feedback guided us to look at prevention and care standardization in a new way. The result was a comprehensive focus on hygiene.

What we inadvertently discovered was that the pivotal facilitators for preventing healthcare-associated conditions are a patient-centered vision and building an interdisciplinary culture of team ownership and team work. These culture changes have been facilitated by weekly interdisciplinary improvement huddles, clarifying standard work based on HAI prevention principles, promoting healthcare infection prevention, information leaders speaking up in real time about patient safety concerns, and interdisciplinary HAI case reviews.

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Kaizen means process improvement. Our application of this method includes building teams, which begins during the assessment and planning process, going to the gemba, or where the work happens, to observe and to interview patients and staff, determining shared focus related to infection prevention and building on previous standard work from the earlier cohorts.

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Concentric circles represent each cohort's contribution to the standard hygiene work. The second cohort defines standard work around patient hygiene, or what we typically call bathing. When the third cohort, comprised of four critical care units, both adults and pediatric, reviewed the patient hygiene standard, they said, this is patient hygiene for the stable patient. We need to define patient hygiene for the unstable patient, our patient population. Subsequent cohorts reviewed and refined the standard work. The most recent cohort is focused on multi-patient equipment cleaning and engaging the patient and family in the patient's hygiene plan.

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Here is one of our improvement huddles. It includes many quality indicators and monitored processes, in addition to HAI prevention monitored processes.

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One example of the impact is in our house-wide CLABSI. The standard infection ratio, which is observed infections divided by expected infections, fell to a respectable level within SIR of 0.647, or 36 percent better than

expected. This metric also includes 33 mucus barrier injuries, [and] CLABSIs, which are mostly identified in our oncology patient population. Our goal remains zero and we still have work to do.

For the units that participated in the Kaizens, CAUTI and *Clostridium difficile* rates have also declined. Other softer results include units identifying suspected healthcare associated infections early on before infection prevention has reviewed the positive lab results, as well as involving patients and families in the HAI case review.

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CLABSI, and indeed all healthcare-associated infection prevention, is a multi-year journey. Sustaining gains require steady focus on the patient and patient safety, as well as engaging the entire village in this effort. We would like to recognize the work of our nursing staff, professional practice leaders, managers and directors and physicians, including physician champions, in our ongoing effort to optimize patient safety and outcomes.

Next slide.

Bethany Wheeler: So (clearly), that looks to be the end of OHSU's presentation. I want – we're running low on time. But I did get permission that we can run at least 5 to 10 minutes over so we can answer some of your questions that have come in. So if you have the time to stick around some extra 5 to 10 minutes, I recommend that you do so we can hear some answers from these wonderful presentations.

First of before we move to that part of the presentation, I do want to mention that CEs are offered for the presentation. There is more information on how to get those CEs in the remainder of the slide deck. So I recommend downloading the slide deck. Once again, that's at www.qualityreportingcenter.com, and viewing the information and instructions on receiving those CEs.

At this time, I would like to turn the presentation back over to Maggie Dudeck from CDC to answer two to three of the questions that came into her.

Maggie Dudeck: Thank you, Bethany. I have answered a few questions from folks during the presentation. But there are a couple of things that I wanted to specifically bring out. One was a question of "When is NHSN going to update the baselines, or when will they be pooled means, because we're using old data in the calculations of the SIRs?"

So our plan is to analyze the 2015 data and use those data for new baselines for all of the HAI SIRs. So that would be for CLABSI, CAUTI, SSI, and the MRSA and CDI lab ID events. However, because we are using

2015 data, of course, we need those data reported to us first before we can analyze them and use them for a baseline. So we will begin some preliminary analysis later this year, and we'll have final risk models. Our plan is to have those done by August of 2016. So that is coming.

Another question is, "Will CDC be removing the MBI CLABSIs from the CLABSI SIRs?"

And the answer is yes. Once we analyze the 2015 data for a new baseline, we will remove those MBIs, LCBIs from the CLABSI measure, and we will analyze the MBI data separately.

And I think that covers just the two big questions we came in.

Bethany Wheeler: Great. Thank you, Maggie. Now, I'd like to turn the presentation back over to Dan at Lake Regional Health System to answer two to three questions that he had answered.

Dan Sabourin: Hi, this is Dan. I'm going pass on this section and go to the next presenter. Thank you.

Bethany Wheeler: Thank you, Dan. I'd like to turn it over to OHSU then. I know that you were just presenting, but have you had the chance to look through any of the questions that came in that you might be able to provide an immediate response to?

Lori Ellingson: Yes. This is Lori. We have entered a response on several of the requests for copies of the tool or policies and procedures, and we'd be happy to send any of those out. If you would just send me a request by email, and we put that in the response to the chat. But essentially my email address is ellinglo – E-L-L-I-N-G-L-O - @ohsu.edu.

Bethany Wheeler: Okay, if that all is all the questions that we had, we will respond to all of your questions that you've entered through the chat tool, but they will be posted to the www.qualityreportingcenter.com website within 10 days of this presentation, and you should be able to find all of your answers there that you submitted the questions for.

At that – at this time, I think we are finished with the presentation, and I would like to wish everyone a great rest of their day. Thank you for attending.

END

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