Good afternoon ladies and gentlemen thank you for waiting welcome to the surgical site infection prevention the floor will be open for your questions following the presentation. Without further ado it is my pleasure to turn the floor over to your host, Mr. Bruce Johnson. The floor is yours.

Thank you very much. This is Bruce Johnson, I am from Stratis Health and on behalf of the collaboration of organizations to reduce healthcare acquired infections, we are presenting this webinar. We have the privilege of having Dr. Cima as our speaker. Dr. Cima is a professional surgeon and consulted for colorectal surgery at the Mayo Clinic. He is been at the Mayo Clinic since 2003, a native of California, did his undergraduate in medical school in California got his medical degree from Stanford and then his surgical training and research Fellowship at Harvard Medical School, Brigham and women's Hospital. Doctor Cima also returned for two years, as an associate surgeon and has clinical interest including invasive surgery, inflammatory disease, Crohn's disease, etc. he also has had an interest in surgical quality and safety programs both at the male and nationally and we are really pleased to have him as our speaker. Dr. Cima?

Thank you, Bruce and thank you for inviting me. And, what I would like to do, go through a quality improvement work we did here at the Mayo Clinic in collaboration with the joint commission and center for transforming healthcare. This is a collaboration with six other institutions including Cedars-Sinai in California, the Cleveland clinic, Northwestern in Chicago, Stanford was involved, and the same with the North Shore LI J. And that was a multicenter project where we basically did, similar to what Dr. Robert Cima is doing look to our multiple centers, share data talked about best practices, we actually visited multiple sites and instituted in each place trying to institute programs to improve outcomes as far as colorectal surgical site infection. What I will share with you is what Mayo experienced in this effort. Pretty much what we continue to do today. I don't have any disclosures in case that was a concern. I am going -- I know the slides will be shared but I wanted to go very quickly through some of the introductory information so we are all at the same level as far as understanding about hospital acquired infections. I won't necessarily read the entire slide, because we will talk in more detail later about
what we actually did. As we all know, hospital acquired infections are major problems for both our patients, hospitals and the healthcare economy. In surgical infections in hospital acquired infections, surgical site infections are right up there as the main conjured bitter to this problem.

If you just look at surgery in and of itself excluding other types of infectious problems that arise, surgical site infections are a major problem, just because of the volume of surgery we do we are a country where a lot of people get surgery, so, the more you do, the higher the risk the volume of I should say of patients affected becomes quite high. Of course SSI is the most common healthcare, help associated infection in surgical patients. Unfortunately, I belong to a surgical specialty that is often tagged with having the highest rate of SSI's. If you look at colorectal surgery across multiple papers, both in the US and across the world, colorectal surgery is almost always associated with the highest rate of SSI and that ranges anywhere from 3% to 30%, in the literature, for specific types of procedures.

And, there are a number of things that go into SSI's. Is multifactorial, there are patient specific factors, disease specific factors and procedure specific factors. All of which have been shown to influence the rate of SSI. And, what this tells you, though, is not going to be a magic bullet that really, I think, a lots of people don't -- a lot of surgeons don't really, fully appreciate that. Certainly a lot of administrators don't fully appreciate that. That, there isn't really going to be one thing we are going to be able to do that is going to be a significant contributor to reducing surgical site infection whether it be in colorectal or any other area. What is the implication of that? Well, we know increased length of stay is associated with SSI. We did a small study here in colorectal looking at what were cost differentials and we looked at patients who did and didn't have SSI's and this is sort of almost a napkin sort of analysis it wasn't anything we ended up publishing because of the wide variance, but these were cost that we incurred related to specific SSI's.

Whenever you talk about cost in the healthcare you have to be very careful about how you use that term. We -- I get data given to me from institutions, SSI costs drove it out by $80,000 will turns out I look and the patient had an MRI post procedure and ended up in the ICU unit of going to cardiac gap, with a wound infection but that would infection didn't drive the cost, you have to always be circumspect when you look at the cost data in relation to SSI. We know it also increases admission rates, which are a major cost to the healthcare system. You have to remember the risk to the patient and the problems, increased morbidity, pain, discomfort, delaying going back to work, be with her family so that is a big issue, the most important issue really. And also there is some data to suggest that patients with SSI's risk of exposure to other patients and we have seen that certainly with different types of colonization and hospital acquired infections, a patient can then be a focus for other patients getting exposed to hospital acquired infectious agents.

So, we sat down with this group and said what can we do to reduce our colorectal SSI's? It is always important when we do this type of project, as I have right now probably two dozen different quality improvement projects here at Mayo in regards to surgical practice. You really have to start off with what is the practice, the scope of the practice who is doing what. Just to give you an idea about our practice, and where this took the context in which this took place is, we do the full-spectrum colorectal surgery from benign disease to highly complex rectal and oncologic issues. We have a very high volume of using minimally invasive approach to our colectomy, which is about over 50% of our practice now is minimally invasive. We are staffed by board certifies -- certified colorectal surgeons we work with general surgery residents and we also have four colorectal surgery fellows, trainees have completed their entire enteral surgery and
are getting an extra year of specialty training. We have dedicated operating rooms, we operate with the same team every day. I have the same operating room, the same for the last decade, the same nursing staff, with me for the vast majority of that decade.

All of our patients cover a dedicated colorectal forward post-op nurses, the vast majority of their experience is colorectal patients. They rarely get patients who are off floor patient so they are very experienced and very dedicated to the care of these patients. That is sort of the practice setting. I know that is different than many other hospitals and that might certainly influence the ability to institute some changes but, clearly, we have a very close system which allows us to focus and introduce change in a way that is highly compliant. A couple things we have to sit down and point out if there are always going to be variations in healthcare events. There is going to be natural variations, things that are just within the system, that are going to be attributable to anything. Then, there is going to be special cause variation or something can be fixed are influenced. That is really what we try to do when we do quality improvement; we look at the special cause variation. We try to minimize all other variation.

Why is that important? Because in the healthcare, diversity is good, in most things in life it is good, at a cocktail party it is good, the community in general. But, when you're trying to do quality improvement, diversity is a problem. You really don't know what is influencing your outcome. One of the goals we always try to do is get uniformity in as many things as possible. So, then we can narrow down and focus in on the things that might be the special cause variation. The process we use here and we have used for this project was the DMAIC standard quality improvement tool. We go out and define what we are trying to do, we measure, analyze, we measure improvements and measure again and enter into our control phrase. This is sort of the approach we take with almost all, if not all of our quality improvement projects.

It is important to know or restarting. Under we first had the discussion about the hysterectomy project you have to know what data to use and I am not here to advocate for one data set or another; when it comes to SSI there are two major ones out there. There is the institutional infection prevention data which is by and large based off the CDC system and we get those types of data, we use the data and for some participating institutions there's also the national quality -- surgical quality improvement program or NSQIP data where charts are -- by trained as soldiers they only look at a sample which there is a methodology for connecting not. They do act a follow-up, reach out to patients to find out if there is any problems, if they have gone to another hospital or emergency room, been treated so there is two different sets of data you can use. When we sat down to start this project, we had to decide which data set we were going to use. And, there are different triggers. It is always important when you get data especially from someone in the institution or your institution; you have to understand where did they get the data? What type of quality data is it, are there any exclusions or inclusions how are things identified and especially in infections? How are they identified? So I put up there the differences between the two systems. And, again, I'm not here to advocate one versus the other, but I'm just going to show you what we did when we looked at our analysis. We basically said ideally Mayo would be an entire sample of IPAC day which looks at all the infections that occurred in our institution because then we can use one versus the other. But we did is basically took all the NSQIP data and say how often do they get identified in IPAC data. Basically what we found is the systems were looking at the same patients. There was a lot of disparity between what was being identified as a surgical site infection and a lot of that has to go with the very specific rules that IPAC uses for reporting purposes they don't include type? Was, they don't include certain other words, a certain duration of cases so, what was happening was we were ending up getting, seen different populations. For trying to analyze the data we felt, for our practice and what we were trying to
do, using the NSQIP data was going to be more useful. So once you commit to a data source you have to commit to the data source and follow it through.

So, we, throughout the project and moving forward for the quality improvement team, we used the NSQIP data. We do benchmark with our IPAC data which is provided by our colleagues in infection control and, it is similar but, we don't go diving deep into those cases necessarily unless there is something really weird about our data when we compare because it would require us to reanalyze the data coming in. We have a set data set so we have continue to work with the NSQIP data. We basically had a lot of data in the NSQIP system for us. And, we basically said where are we starting out? And, we were asked quote unquote as expected in our performance. Or average rate was somewhere around 9% for colorectal. Which is on the good side of the rate in the report of literature, but the goal of course is always to try to get better. We had a long series of data but basically showed us that we were pretty stable around the 9% rate for colorectal surgery.

Then, we went to the define phase of our project. What was our goal? We made it very specific we basically set our goal was to reduce it by 50%, we had a timeline and our inclusion and exclusion criteria. We weren't going to look at cases not done by our group so, sometimes GYN oncology does cases that get included in the data set, we were going to try and focus in on our practice, and patients we have direct control over and set up our rules about how we are going to manage those patients. So the patients who fell from different practices got excluded from the analysis. That was one thing. We were going to look at everything and we excluded some other patients that may end up with colorectal cases such as patients who also get a transplant at the same time that we have been asked to participate in.

We already had our measurement, our baseline measurement, so we went from the define Phase II the measure phase and we already have that data fortunately from NSQIP, I have already shown in that. And then we went to the analysis phase. It's great when you have a rate thing you have to know which types up problems are they. So this is sort of a [indiscernible] approach which were superficial, which were deep, which were organ space, how often do we have them and it gives you an idea, very high level idea where is the low hanging fruit. People say well, you shouldn't even care about the superficial infections because the ones that drive cost and the highest morbidity are organ space. That is one approach. My view if you can reduce any affection is a good thing. If we could reduce or completely eliminate superficial infections, that is perfect for our patients because it is from a volume point of view, that is a big driver. Certainly, we want to reduce organ space because it is a big driver of economic, negative economic impact but still, the project was to reduce surgical site infections, figure out a way of doing that and see what we can do. This was the first part of our analysis.

The next part was, it is great to look at the rate but one of the issues is what about the patients, whatever procedure did they have. That was one of the reasons we favored using the NSQIP data as opposed to the IPAC data because in the data set that comes all those variables. From our IPAC data it is great, I can get a list of the patients, I can get their clinic numbers, I can get who the operated on, who operated on them, the date all that information a lot of the other information I would have to physically go in and get to. That is one of the biggest issues with quality improvement. A lot of people have to spend a lot of time digging in to details, getting the position engaged becomes a problem. The nice thing about NSQIP is we had all the variables, had our to been collected we were able to analyze it, we focused in on what were significant variables in our practice. Some of them we are not going to be able to change but, it gives us a better idea of who is a high risk patient and who is not. This is showing you what the variables
for -- word that had influences, what we looked at and where we thought we could go with our improvement.

Also a big thing, we found some other things that became issues for us in doing this analysis. We found, as many might expect but have not been shown, different types of infections go with different types of diagnoses. Even though the surgery might be the same a patient is having a low anterior section for cancer, versus a patient having a low anterior section four diverticulitis, their types of infections are different even though the procedure is identical from what is removed and how you remove it. So, again it goes into the factor that not just one thing is going to make a difference.

What we found, over 50% of all our infections occurred in our IBD patients. Patients with either person disease, ulcerative colitis or inflammatory disease such as diverticulitis. Our cancer patients had an extremely low risk of infection, even though they are having the same type of surgery. That leads to -- let us to other conclusions about how we can change our surgery. VMI was an important factor as well as operative duration. Another thing we wanted to do was look at our surgeons. A lot of patients don't do that and we said it is interesting because we all trained here we all our colleagues we've been doing things the same way but we don't operate together. We operate separately.

Says we all trained your without we were doing things all the same. So we sent out a survey, I have the survey here, about what a patient thought we’re relevant and what we do. What we found even though we all trained here and thought we were doing at the same way the vast majority of the time we weren't doing at the same way. There are little things we all do differently. That was really -- wasn't to say who was best we didn't tie that to individual infection rate, but what we found was it was a starting point, the survey tool was a starting point for people to start discussing what do we do differently and what can we all do or agree upon to do the same. We gained consensus on a number of items about what women do going forward to standardize for our entire practice. So that was one big step. The next big step is it cannot just be the surgeon doing something different, you can't just say make everyone else change, you can't just say surgeons do something different. It was a multidisciplinary staff, we had a infection prevention staff, we had our NSQIP staff we had pre-op nurses, for nurses, or nurses, pharmacy involved, a whole group of people literally 20 some odd people involved in an effort to try and standardize as many interventions across the entire episode. It is not like everything has to be focused on the operating room, a lot of effort we will go through on things that happened before and after. The other thing it is important and healthcare to build these things into the system, not have people remember them because there are too many things to remember, too many new quality initiatives, too many things that happen over time. You need to build it into the system so people who want to do the right thing are able to do the right thing, not have people try to remember what the right thing yes.

We also do frequent indications were 13. I feedback on a monthly basis to everybody involved how we are doing. This is just to show you the team, a lot of people, some people say the team is too big and they become an effective and that is really dependent upon the leadership and how that goes but we got a lots of good people engaged in different areas to help us Institute this project. Again, this is hard to see on the slide but what we basically did, when we look at the entire episode, we looked at basically 16 to 18 elements without we can build into our system that would have an impact. I'm going to go through them but now we are in the improve phase of our DMAIC pneumonic. We are trying to figure, here is our goal on the left side of the slide there, and we looked at the four phases of the surgical episode, the pre-op, inter-op, post-op and
the post discharge or hospitalization. Then, we basically look at elements in each one of these that we wanted to implement. And, how can we build them into the system. These are the elements here I will go through them in a little more detail later. So, the other thing that goes into this is, whenever I talk to people at other institutions and other surgeons they say show me the data for this individual step.

That is a very reasonable approach that if you look for that in every single step you are going to become paralyzed. So our approach was to say, we are going to Institute this given that it is reasonable, that it -- there is support in the literature for it and that it is cost effective and safe. Something that we can build into the system. One of the things we did, based on some of the literature support was, everybody gets preoperative showers with chlorhexidine. We developed these small instruction manuals, we have two packs of so and in some patients we give them more than two then standard patients come in and we get them.

With instructions and it also is an opportunity to engage the patient about hand hygiene which is also built into this about infections in general and information about what to do and this starts before the surgery. This is a discussion we have with the patient before surgery. We give it to them the morning of admission the nurses have it built into the algorithm of things they do we built it in they ask the patient if they used the soap. If the patient did, fine, if they did not, we have an order automatically that forms to wipe them down with the SAGE cloth. We also identified in our analysis, patients with a BMI greater than 30 were 10 times higher risk for superficial wound infection. If the patient has a BMI greater than 30 even if they did the shower they also get wiped down. I will show you how that happens automatically in the way our listing software when we list a case it goes and searches the medical record and put on their if the BMI is greater than 30 it actually tells the nurse this patient is going to get the wipes because they're BMI is over 30. This is what they basically see when they arrive. It automatically tells them the BMI is greater than 30 so your total body cleanse with chlorhexidine wipes upon admission. It is built into our order sets but only flags if the patient has a BMI greater than 30. That is because we have an integrated electronic record again it is built into the system so a brand-new nurse doing the admission would say this they don't have to remember six months ago Doctor Cima and the team said to do this, this is part of the order set, part of the process and they will do it. Other things we did automatically were we of course, everyone knows about skip antibiotics but it doesn't always happen. People don't remember, residents doing this have their own view of how to use antimicrobials so again in our listing software we have decision support which helps and this is what they will see if flags on the page the cases been identified that once it needs to have a certain antibiotic and these are your choices. We also, based upon data in the literature we do weight based dosing which is a requirement, so we’ve been doing weight based dosing of for the last four years. There are new recommendations such -- that just came out for multiple infectious control societies about weight based dosing. We have been doing this based on our colleague’s information a number of years ago. Based upon the patient's weight, they get an appropriate dosing. We also, based on some data, recommended we dosing at three hours.

So, if the case goes longer than three hours they get re- dosed and that is automatically ordered we do this. Why did we do that? Because we found that over 60% of our cases were coming off right around four hours. Which would be the standard we dosing. That's not the time when the anesthesia wants to be giving meds that is not the time our nurses want to be going and getting meds because it is near the time when they are closing. So, the rationale behind this between our pharmacy and that these -- anesthesia colleagues if we could know ahead of time we can get it in and also you want to keep the tissue level at its highest when you are closing and not just when
the incision is made. We selected three hours and we built it into her system and I will show you
that later, to remind our anesthesia colleagues about that.

Again, this is also what our nurses in the ORA get in the morning for each case, down at the
bottom here is the medications. What to give but also automatically will reorder, repeat if it is in
two hours. They already have the order written to do that. I don't have to remember as a surgeon
in the operating room at three hours to look at the clock and say okay but by the way we does
their antibiotics. It's built into the system in multiple ways. Some other things we of course did
operating room clippers as everyone has been doing for years now, but then we standardize the
prep. What we found people in the rooms were doing different things. Some people use Betadine
so -- soap and prep other people using chlorhexidine other word using during prep we said we
are all going to use one thing based on the literature we selected Chloraprep. But this is where
you have to talk to the people doing the work. In our ORA we have surgical assistants that
usually do the prepping of the patient and one surgical assistant came up to me and said you
know Dr. Cima if you read the instructions for core prep -- Chloraprep on the dispensers it only
covers a square foot. People are using these, one stick for the entire abdomen. If the youth
DuraPrep covers a bigger area we had already committed to doing Chloraprep but we had to
educate people that you just can't use one stick because most of the abdomen is not just a square
foot exposed given the nature of the patient population.

So, it is important that you realize when you institute these things that you really have to follow
through and get down to the detail of looking at what changes you are doing and making sure
that yes, we could have converted to Chloraprep and not told people or not about the fact that it
only covers one square foot entity of the patient you are doing nipple to keep us prepping for a
big abdominal case you may need to use three of these to cover that area. And you have to be
putting it on appropriately. And so there is a lot of education that goes on and you have to make
sure it gets down to the people doing it. Again, we standardized to one group of people doing it,
not just the resident does your - comes in and prep, because they would never know this and so
that may be a factor in surgical site infections so again you want to standardize it. We basically
do the inter-op developments, we have the re- dosing I wanted to talk about we dosing what it
does in our anesthesia computer is when they document they have given an adamant
preoperatively, -- given an antibiotic -- it starts the timer the background turgid -- triggered of the
first dose administration and then what happens about three hours, exactly three hours later, they
will get a reminder screen that pops up on the screen saying you need to re- dosed because the
last dose was given at this time and now you are three hours into it. They can pause it, sort of the
snooze button it, if they are doing something else but then it pops up again and the goal is to get
them to re- dosed and this screen will go away, it basically locks the screen and they have to --
until they were does the timer starts again.

Another thing we did, I know there was a lot of pushback or concern about this, we basically
started a closing process where when we are ready to close we use completely new instruments.
You have to understand when you are doing colorectal surgery I'm asking for instruments, I have
the bowel open issue before coming my hands are going back on the the nurses stand, so there is
a risk other instruments are getting contaminated and at the end of the day we take, we start with
instruments to close the scanned that have been going through or least contaminated by bowel
contents. So what we said, we are going to get rid of all the 30 instruments, great prep -- not
report but Reebok the area have the operating surgeons change the gloves, bring up a small tray a
new instruments that are completely clean, this is a picture of that, and then we do the closing
using brand-new instruments. So we introduce these processes post op, we basically made sure
all the antibiotic dosing Chris -- was correct, not just with our nursing and staff we emphasized
hand hygiene also with patients and families reaching back to that initial information that we gave them. They know about hand hygiene, we tell them up front, we tell them how important it is. 40% of our patients and up with some type of stoma, temporary or permanent, so there is a lot of dealing with contaminated tissues and things around contaminated surfaces.

So, we were very concerned about this and really wanted them to understand that. We put up signs in the rooms and we keep our dressings on until post op date 2, that was standardize before people were talking them off -- taking them off at different times but different times that is in is addressing comes out the patient gets in the shower with chlorhexidine and they are dismissed with a bottle of chlorhexidine to use at home. So, there were a lot of things we did on the floor with her nursing colleagues and our residents and staff to basically get everyone doing the same thing. Now when you are in the process improvement things you also need to make sure you do audits to know what you are doing that you are actually doing what you want to do, because that is the concern.

You can put in all these things and if you are not doing them you don't know if it helps. There’s a lot of different data to compare and see how we are doing. A couple things we wanted to do was look at how good were we ever dosing after we put the watcher in, what we call that, and basically we went from 66% we dosing within the three to four hour range to 100% within three to four hour after implementing it. These don't have to be huge samples, these are quick samples. We did 30 or 40 patients here, but we did it just to make sure we were doing it right. We wanted to know if our operative times increased by doing the closing can. We basically were concerned, we said long duration of cases have a higher risk of infection now we put in a new process to close, when that may slow things down and what we found was we had no change in our overall operative times related to this. Once it is built and the system and people know what they are doing it doesn't really change that much at all actually it went down slightly. Then restarted looking at her patients and we wanted to compare for when we started to what we did.

In 2011 we handle this data initially, this is the first group of patients we looked at we wanted to compare our patient population and Billy there was no difference in the patient population other than we have slightly sicker patients when we started doing the bundle and introduced the bundle. We slightly had a view more contaminated cases, statistically significant, more, those were the only difference. From a size point of view, BMI, diabetes, there was no real difference.

In January of 2011 we rolled out this bundle as we called it. We've been doing a lot of prep work beforehand. And, basically we started out at a rate of two years preceding an average rate of 10%. Slightly higher than the 9% ESOP that was over a longer period of time. Within the introduction of the bundle we didn't -- we went on to average rate for the tire year period January, up 4%. That continued, I don't have it on the slide, through the end of 2012, we were around 4% to 5%, the first six months of 2013, we bumped up to eight% and we think we know why. We had a few changes in our practice and then we are back down now the most recent data I have is we are down to 5%. This is our overall SSI rates, are superficial rate with a lot of things we did which was directed at superficial, almost went to 0. 1.5%. Surprisingly, our organs base infection rate also declined. We didn't do anything specifically directed at that, but I think a lot of these other issues and the fact that people are more concerned about and reporting on it had an influence, a halo effect. Perhaps some of the things we did maybe with the better use of IV antibiotics had an impact on that. But, we still have a very low organ space infection rate going forward.
This past year, what we saw was an increased rate in our superficial rate and we've made some changes back to where we were. I think that was mainly an education issue. We met our goals, we became low outliers and performance in this data report. So, what I really wanted to get across with this, I went through pretty quickly, because I know usually there is a lot of questions, I am happy to answer questions, but what we learned from this was, really, it is not just one thing. Because it is not one thing it involves more than one person. You need input and expertise from all different people. So, a multidisciplinary approach is important. You just can't be going to the surgeon saying you have to do this, you have to go to our anesthesia colleagues you to go to the nursing colleagues you have to involve the patient early on, you have to change processes at multiple levels. You need to set yourself on it using a data platform that everyone trusts, that everyone thinks is going to give you the information you need in a timely fashion and ideally has more than just a yes or no. Infection, yes, no infection. It's got to give you more. Without that you can't really Taylor to your system what you need to know. Do you just make the assumption that everyone that is heavy is going to be higher risk? You could but we wanted to prove it because we were going to put money into it. So, we looked at our data, guess, that was the case.

Do you want to go with Chloraprep knowing you will use more of them versus DuraPrep? We committed to Chloraprep for a number of contractual reasons we could use DuraPrep but there were different reasons you have to understand what you're going to do and why you do and there will also be other influences. You have to use data that gives you more depth. That was something important because people always ask for those questions. They want to know my patients are diabetic versus not diabetic, that is why it is higher, I don't really know if you need that detail for it to be successful, but I think you do to champion and convince people that you know enough about the practice to suggest changes. They want to look at changes.

The other thing, you have to really walk the process. You can't make assumptions saying that our policy is X. During this visit -- during this Consortium we met with and worked with the joint commission, when I traveled around we had the opportunity to see that we go to all these meetings and people say our policy is X and then you go to the oh are and you talk to people in the oh are they don't know anything about that policy they are doing something, the same thing they've been doing for the last 20 years. I saw many an hour charge nurse or nurse administrator give -- get a little frustrated because they were there when they found out someone in the OR says we didn't know that. We've been doing it this way. So, you really have to make sure that what you are trying to do is get down to where you want to get done. Is that the patient level. So policy and practice are not the same. Ideally they should be but when you get in the OR, as people who work there know, everyone, the OR seems to be its own little Vatican City, and they do it their own way. And, that is one of the things you have to try to get into, say no, we all agreed for these reasons, we are going to do it this way, and then you need to go back and make sure that they are doing it that way.

Another thing we learned was you just can't look at one thing and expect success. It is going to come across the whole system. You have to, because everything could be impacted. You can do something great and of the other end of you are doing something and it impacts and you don't know about that. You have to look at the whole process, you have to value stream map it out and look at where you can make interventions. And you have to go back and make sure you are doing those interventions again. It goes back to policies and practice oftentimes in healthcare is different. When you change something you need to go back and make sure it is actually getting done and you have to do that intermittently. Like I said, everyone that has worked in the hospital wants to do the right thing. They want to have good outcomes, they want to take care of patients. But, there are so many things they have to remember, so many things they have to do. You can't
expect them to remember the details when they are also taking care of this type of patient and that type of patient, remember how orthopedic wants to do and how colorectal is doing it. You just can't expect that in a reasonable way, as well as take care of the patient, to do the other things you have to do.

So, you really need to build into the system. It can't be on peoples root -- rely on people’s memory to do it. That is not just effective. You need to build it in a way that drives compliance. There is a lot there, I was increasing more data, with introducing these types of bundles, if you don't achieve 85% plus compliance with the elements, you are not going to have success. So, we struggled for greater than 95 percent compliance on all these elements. We have been checking it and the vast majority were at very high compliance.

Really that is a summary of what we have done and I really want to take the last bit here to answer questions and turn it back over to Doctor Johnson.

Thank you very much for this wonderful presentation. I am going to start the questions off with this one.

Karen? Can you open the lines for people, please?

The floor is now open for questions. If you have a question, please press the number seven on your telephone keypad.

You mentioned a lot about standardization. And you mentioned that you did this with your select group of surgeons. So, here is my question. Is the process you described duplicatable? Have you done this and other areas of surgery or other surgeries at Mayo?

Well, the process certainly could be replicated -- it's not hard to do. That, you have to make sure it makes sense and where you are doing it. For example a -- in a clean case there is no reason to change the instruments because everything is still clean. You have to make sure this is where you are really thinking this out, those to the point, you could say they had success of change instruments let's do it across the board well in certain procedures that will make sense and people will say where we do this it makes no sense as people start saying things like that, you have lost. So, we did when we reported this, our colleagues in GYN oncology said well, we do a lot of contaminated cases and we have a lot of large women we are operating on. They have a lot of diabetics. Basically, they have undertaken a process very similar to this. Not all the elements are the same but they have gone through the same sort of DMAIC approach, user data, looked at it and have adopted the closing Pam. They've also done some other things that we don't have to do in colorectal because of the nature of the surgery. So, it is very important. It could be replicated. The whole process could be replicated from beginning to end but replication and duplication isn’t the same thing. Replication in my mind it means doing the process, finding out what works for you or what is needed for that specific practice and then implementing those and using the same things. Auditing, making sure you are doing it right. Some of the things could be duplicated like the weight -based dosing, they took that over and use the same thing for them. It all depends. That has to be done smartly.

Thank you.

Again if you have a question on the line please press the number seven.
I was just wondering if you could explain the disparity between the research data and some of
the other data coming out showing much lower rates, NHSN data.

So are you saying HSN data is higher?

It is lower.

Well, that would be the case here too when we looked at our rates, comparing our rates with our
institutional provider data and looking at our NSQIP rates we were twice as high in Mayo 11
there we were with our institutional rates. And, I think it is because of the systems are designed
to report totally different things. Yes, they are designed to report SSI's but the focus in how they
collect their data is completely different. So, -- I am not criticizing or advocating for one over the
other; I am just saying the data is different and you have to put that in your mind where they
interpreted. So for our institutional data it is heavily weighted towards organ space infections. It
is heavily weighted towards patients that do get readmitted for treatment and so the triggers to
identify who is SSI and who is not are vastly different. In somewhat of a semi- passive system, if
the patient doesn't come into hospital or go to a local hospital or does go to a local hospital and
that hospital doesn't report it, like they are theoretically supposed to buy policy, again practice
and policy are different. You are going to miss that patient. NSQIP is little different in the sense
there is an active component to it, the actively go through and look at all the charts, the actively
send out information requesting stuff from the patient and they are more likely to pick up
superficial infections too. So, it all depends on what you are asking it to do. Some of the data has
restrictions have a risk adjust the patient's certain patients get thrown out of the system because
they are class 4 wounded, in our case, those types of things. NSQIP basically doesn't care, it
looks that you had surgery, I want to know what happened to you. Doesn't matter what you had a
four. They collect different types of data and that is why the national data through the CDC
system is lower than when surgeons report and it also has a different patient population and looks
at. So, if you are physically -- only concerned about deep wound infections, organ space
infections, in a practice for those patients are coming back to that same hospital and getting
treated there I think that data is great. If you want a broader perspective or you have a patient that
has a big referral system, moving in and out and going to other hospitals, it may not be giving
you the true rate. I don't know if we ever know what the true rate is because you are never going
to be able to pick up everything. I think that is the difference and when we start talking about
statewide initiatives and stuff everyone has to know there are going to be differences in the have
to accept that.

Thank you.

Up -- again if you have a question please press number seven on your telephone keypad. Again,
to ask questions please press the number seven. There appears to be no questions at this time.

Dr. Cima, I wanted thank you so much again for this presentation. It was excellent. We are going
to be closing. Mary Montury will be sending a link to a survey on this to people who registered
and, please fill that out. We would like that feedback. Thank you again, and everyone have a
good day.

Thank you.

This does conclude today's teleconference. You may now disconnect. [Event concluded]