



**Catheter-Associated Urinary Tract Infection:
No One Owns It ... We ALL Pay for It! (SP 25)
August 19, 2010
Webinar Transcript**

Charles Denham: Good morning. This is Charles Denham. I am Chairman of the Texas Medical Institute of Technology, and it is my honor to welcome you all to the TMIT High Performer Webinar: "Catheter-Associated Urinary Tract Infections: No One Owns It ... We ALL Pay for It!" We thought this was a pretty fitting title in that this is what we know to be a very, very high-impact problem in the U.S. and around the globe, and that we have a terrific opportunity to have an amazing impact on this condition and so many conditions that then cascade after we have urinary tract infections. A couple of housekeeping details for all of you that are on the webinar: Many times, because we have such high volume, we have a number of participants who have problems with their audio levels, and on slide 3, we would just like to remind you to check your WebEx volume that you can adjust on the WebEx webinar function. If for any reason you cannot get a high enough audio, depending on your location or the technology on your end or our end, you can request a phone line and click on a phone line "request button" at the very bottom. You see that on slide #3; I am on slide #3 now. Our disclosure statement I won't read. However, we just want to provide full disclosure regarding this webinar and the fact that we will not be addressing any products, services, or technologies for sale through any associated relationship of anyone presenting. We are really blessed today to have Dr. Carolyn Gould, Dr. Sanjay Saint, Jeanette Harris, Denise Graham, and Dr. Patti O'Regan to be participants in this round table. We will have a fast-moving webinar that will follow through.

I am just going to open the mike to Patti O'Regan, who is not only a nurse practitioner and recently received her doctorate, but also is a patient safety advocate champion. Patti, are you on the speaker's line? If we don't have Patti on, there may be trouble for her to call in, and we will go back to Patti at the end of our session. We tend to like to open these webinars with an opening inspirational comment from a team of patients' advocates who support TMIT as an advisory panel and are actually involved with many of our activities. We have about 10 patient advocates, and Patti is one of those dedicated participants.

We have such great speakers; I am going to keep my comments very limited. I am on slide #7 and talking about the practice overview. Just to give you a little bit more reinforcement of what is available on our landing page of www.safetyleaders.org, you see illuminated by a red-bordered box up in the menu window, where you can click to get the assets for the webinar. I have advanced now to the next slide and am showing the assets, and the place where you would go to download supporting assets and information as well as the transcripts. We will have those out within 3 or 4 business days so that you can have that available to you.

Our mission at TMIT, and I am on slide 10, is to accelerate performance solutions, and our main focus is to save lives, save money, and build value in the communities we serve. We think this topic and all of the healthcare-associated infection topics are absolutely critical. They do save lives while saving money, while building value in the community of those that are adopting the best or better practices.

The next slide really is an opening slide that you will typically see as a new viewer of safetyleaders.org. I just want to remind you regarding some new programs that we have. An AARP article describing some of the work that we are doing with Dennis Quaid as a patient safety champion, who has joined TMIT, has gone out to 47 million Americans in 24 million homes and will continue to roll out through September. We have launched a new initiative called CAREMOMs, which I will allude to a little bit later regarding a grassroots effort to help drive adoption of safe practices and patient safety. We also have a hospital leaders' toolbox which will be released in September that will provide this movie (and I am on the next slide), *Chasing Zero: Winning the War on Healthcare Harm*. The latest numbers are 3.4 million viewers have watched it. We have tens of thousands that have logged on to the website and are getting CEU and CME credits both through Discovery Channel and also associated partners. You can watch the entire movie from our website, and the movie will be available on DVD. We will be giving this DVD to at least 4

members of every hospital team in America. Every board chair, every CEO, every chief quality or patient safety officer, and every chief nursing officer in America will receive not only the DVD, but a lot of assets that will be on the disc. Finally, you can go to our website and see the trailer for the next movie, that will be another feature-length film, *Out of the Danger Zone*.^{*} It will be focused on the technologies that prevent the harmful impact of healthcare and hospital accidents. It will be using video and experts from the Top Gun Naval Weapons School through maritime safety, aerospace, car racing, both Formula I and NASCAR, and a number of other highly risky and high-risk environments.

Finally, CAREMOMs (and I am on the final slide here) is a grassroots initiative that we recently launched on the Joy Behar Show with Dennis Quaid. You can go to our website and see a grassroots effort that we are building to help what we call the chief family officers in America. 70% of healthcare decisions are either made by a mom or a dad as the family member and the chief family health officer, 1 in 4 Americans [is] a caregiver of someone else, and 70% are women. CAREMOMs has just been launched. There are a number of video clips from a number of patient advocates, and we are honored to have Sue Sheridan be the leader of this initiative for us. The Safe Practices for Better Healthcare were released in April of this year at a national press club event by Dennis Quaid. We had Assistant Secretary Howard Coe, the President and CEO of the National Quality Forum Janet Corrigan, and a number of senior officials from the government, as well as leaders from certifying quality organizations.

That is my quick introduction. One of the safe practices for better healthcare focuses on urinary tract infections. However, who better to share with us the latest from the CDC but Dr. Carolyn Gould. Carolyn, would you please take it away?

Carolyn Gould: Sure. Thank you so much. I want to thank you all, and thank you, Dr. Denham, for having me here on this webinar. I am really excited to be on this wonderful panel of speakers. I know you have a lot of speakers coming up, so I am just going to get right into the talk. My focus right now is just to give you an overview of the CDC Guideline for Prevention of Catheter-Associated UTI that was updated and became available last year in 2009. I am going to talk to you about the recommendations and a little bit about quality improvement programs and measurements. I know Dr. Saint is going to speak to you a lot more about implementation, so he is going to be a great follow-up to my presentation. As I mentioned, I am going to just mention a little bit of background first on catheter-associated urinary tract infections and then review the updated guidelines. I am going to present it in the context of the core prevention strategies that are recommended for all healthcare facilities, and then some of the supplemental strategies that have been identified that can supplement a prevention program that may have less evidence behind them or may be more difficult to implement. Finally, I am going to just go over a few issues about measurement of catheter-associated urinary tract infections.

This has been a largely, relatively speaking, ignored healthcare-associated infection compared to many of the other ones that have received more attention, but these infections are actually the most common type of healthcare-associated infection. When you look at the national data of infections reported to the National Healthcare Safety Network, UTIs make up more than 30% of the infections reported, so there is a very large burden of these infections that are occurring. There is an estimated more than half a million nosocomial urinary tract infections occurring annually, and about 70-80% of these are associated with urinary catheters. Although they have not been associated with the most adverse events compared to other healthcare-associated infections, because of the sheer number, they actually lead to quite a bit of morbidity and mortality with an estimated 13,000 attributable deaths annually. When they cause secondary bloodstream infections, the mortality goes up to around 10%. They are associated with excess length of stay of approximately 2-4 days per admission and increased cost of about half a billion dollars per year nationally. Importantly, the unnecessary antimicrobial use issue is very important to consider. When people treat these infections, about a third of the time the treatment is inappropriate; they are treating asymptomatic bacteriuria colonization, not treating a true infection that needs to be treated. This

***N.B.:** The documentary is now titled *Surfing the Healthcare Tsunami: Bring Your Best Board*[™]. [01-25-12]

leads to a very large reservoir of antimicrobial-resistant organisms that reside in urinary drainage systems. They have been associated with outbreak of multidrug-resistant organisms that have been a huge problem. We are talking about a lot of things, not necessarily the infections themselves, but the result of treatment of colonization. There are also a lot of non-infectious complications associated with the use of these catheters. 15-25% of hospitalized patients receive urinary catheters. When you look at the nursing home resident population, about 5%-10% of those residents also have long-term catheters, and that makes up to about 150,000 residents at any given time. These catheters unfortunately are placed frequently for inappropriate indications and are left in for too long. One of the reasons for this, as Dr. Saint has demonstrated, is that physicians are frequently unaware that their patients have urinary catheters. There are a lot of reasons for this, but most of the time it is just not on their radar. When they go in to do a directed history and physical during rounds, they don't think to look for the presence of invasive devices, and especially urinary catheters which are often hidden underneath the covers, and they don't pull back the covers and take a look. Also, Dr. Saint has shown in a recent survey of U.S. hospitals that more than half did not monitor which patients were catheterized, and about three-quarters did not monitor duration and/or discontinuation of the catheter. There is a lot more that we have to do, and I know he is going to speak more about that.

In terms of pathogenesis, how do bacteria or other organisms get into urinary drainage systems and into the bladder? They can either get in there externally or extraluminally during insertion if aseptic practices are not followed, or late, by capillary action or movement up the external surface of the catheter. They can also get inside intraluminally through breaks in the closed drainage system, either during sampling or by breaks between the drainage system and the catheter. These are the main ways that bacteria get in, and the sources of the bacteria can be either endogenous, meaning they are from the patient's own body, or they can come from contaminated hands of healthcare personnel during the manipulation of catheters and drainage systems.

I just want to mention quickly about biofilms, because some of the novel strategies in CAUTI prevention have targeted biofilms. These are essentially matrices of extracellular proteins that bacteria develop when they reside on the surface of any prosthetic device. They form these communities, communicate with each other, and they are protected in these biofilms from the patient's own immune system as well as from antimicrobials. We don't have a full understanding of how biofilms necessarily relate to the development of symptomatic infections, but we do know that any prosthetic device, if it is left in long enough and it gets contaminated with bacteria, is going to have a biofilm develop on it. So many of the strategies that have been put out there have been trying to target these biofilms and prevent them from occurring, and a lot of research is going on, and more needs to be done in this area.

I also want to mention to you some of the work that has been done on a national level through the Department of Health and Human Services and their action plan to prevent healthcare-associated infection. They have set five-year prevention targets and have put forth recommended metrics for different healthcare-associated infections. For catheter-associated UTIs, these are the metrics that have been put out there, and these are the ones that are recommended by NHSN as well. The main one is the number of symptomatic urinary tract infections per 1000 urinary catheter days. The national 5-year prevention target is a 25% reduction. Also, the rate of secondary bloodstream infections per 1000 patient days is another metric. The prevention target is 50%-75% reduction in that. Then in catheter utilization ratio, which is the number of urinary catheter days over patient days x 100, a 50% reduction is the goal. You can see the latter two metrics there, the UTI rate and the catheter utilization ratio, are intimately associated in that the urinary catheter days are the denominator of the rate, so they are associated with each other. One influences the other. If you reduced your catheter days, you are going to be reducing the denominator in your rate, and that may affect your CAUTI rate. This is something we are aware of here at CDC and something that has been brought up as a potential issue. As people are trying to do the right thing and remove catheters, are they going to be seeing an increase in their rates, at least initially? That is something we have been talking about and may not be as much of an issue on the individual facility level, but when you are comparing your data to national data, it may become an issue. I am not going to go into a huge amount of detail, but we are working very hard right now. As NHSN is moving into standardized infection ratios and potentially accounting for variables such as catheter utilization, some of these metrics may change, and we are going to be looking into this issue very closely in the near future.

As I mentioned, the HICPAC, or Healthcare Infection Control Practices Advisory Committee, is updating guidelines, and we updated the urinary tract infection guideline in 2009. It can be found on HICPAC's revamped website, and all of the guidelines from HICPAC can be found on this website. I wanted to show you that. Also, HICPAC, starting with the CAUTI guideline, started using new methodology, a very systematic methodology for reviewing the evidence and grading the evidence on the strength of recommendation, so the categorization scheme was modified slightly. The one thing I really want you to take away from this is that all Category I recommendations carry the same strength, so unlike what many people believe, Category IA and IB and IC should be considered equally strong recommendations. The only difference is the level of evidence underlying the recommendation, but all Category I recommendations are considered equally strong and should be implemented. The one thing I wanted to draw your attention to, as well, is under "Category IB": we did provide a provision for some recommendations that didn't have specific evidence in the CAUTI literature, such as aseptic techniques for education and things like that, but they are considered accepted practices based on evidence elsewhere or based on accepted practices that are very difficult to dispute and will not likely be tested, like aseptic technique, for example. You can see in the guideline that those recommendations that are IB that are not based on specific evidence in the CAUTI literature are not linked to a key question. We try to be very transparent about which recommendations are specifically linked to evidence and which are not. Those are the things that I wanted to mention, and I won't go into any more detail right now.

We are doing a lot of work with states that are actively working to prevent healthcare-associated infections, many of [which] are using funding from the Recovery Act. The website I put at the bottom of this slide is a website where you can find a lot of resources we have provided to the states, and they are available to the public, including toolkits, which are essentially PowerPoint presentations on each HAI on the basic recommendations. They are divided into core and supplemental strategies, so I wanted to present the CAUTI guideline using this organization for you because I think it is a good way to sort of look at these strategies. The core strategies are the ones that have high levels of scientific evidence and demonstrate a feasibility. Those are mostly the category I's. Supplemental strategies are those that have some scientific evidence and variable levels of feasibility. Many people have already moved into supplemental strategies for a lot of HAIs, and that's fine. I think the key is that you make sure to implement the core strategies and that these are being followed before you decide to add supplemental strategies that may have less of an impact.

This is just a schematic of the core prevention strategies for prevention of catheter-associated UTI, and these in the guideline are all category IB. That is just because, again, it is the level of evidence, but they are all category I recommendations. They are basically under three basic areas: catheter use, catheter insertion, and catheter maintenance. Under "use," these recommendations have to do with when it is appropriate to use a catheter. The general recommendations are to insert catheters only for appropriate indications and leave them in only as long as needed. Under "insertion," this has to do with the actual process of inserting the catheter, and those are to ensure that only properly trained persons insert and maintain catheters and to insert them using aseptic technique and sterile equipment. That is under the acute care setting with indwelling catheters. There are provisions for in-and-out or intermittent catheterization that clean technique rather than sterile is sufficient. Under "maintenance," the two primary recommendations are to maintain a closed drainage system following insertion and to maintain unobstructed urine flow. You will see in the middle, between the arrows, that hand hygiene and standard precautions are also core prevention strategies and they are underlying all of these. Also below, you will see the box with the quality improvement programs, and these are programs that essentially are the implementation piece. These are programs that ensure that the core strategies are being followed and adhered to. I will talk a little bit more about that, and I think Dr. Saint will as well.

We have in our guideline a table of examples of appropriate indications for indwelling catheter use, and these are primarily based on expert consensus. These went through a lot of vetting, and I think it is a good guide for facilities to look at once you are developing a program; for example, with a catheter reminder program or something like that, you can use this table to guide you on when it is appropriate to use an indwelling urinary catheter.

We also have a set of recommendations under these core strategies dealing with insertion, that you should minimize use in all patients, and we particularly highlight those patients that are at high risk of CAUTI and mortality, including women, the elderly, and those with impaired immunity. We also highlight that basically you should avoid the use of catheters for management of incontinence. Those people are also at higher risk for UTIs, and they are not an accepted indication for use. Finally, you should use catheters in operative patients only as necessary.

In terms of leaving catheters in place, only as long as necessary. We also have a specific post-op recommendation that catheters should be removed preferably within 24 hours unless there are appropriate indications for continued use, and again, go back to that indications table to help guide you.

In terms of insertion, we also have some very specific recommendations about the aseptic technique and sterile equipment, performing hand hygiene before and after insertion, using sterile gloves, drapes, sponges, antiseptic or a sterile solution for periurethral cleaning, and a single-use packet of lubricant jelly. One of the category II recommendations is that antiseptic lubricant is not necessary. Studies that have been done looking at that have not shown a benefit. Also, we recommend properly securing catheters. Just to point out, that is one of the IB recommendations where we really did not find any specific evidence in the CAUTI literature, but there is a lot of rationale to properly secure catheters, and few people would argue, mostly from the standpoint of urethral trauma, that you shouldn't do that. That is just one of those examples I wanted to show you.

Following aseptic insertion, maintain a closed drainage system. We have some specific recommendations under there, that if you have a break in the aseptic technique or an inadvertent disconnection or leakage, that you should replace the catheter and collecting system using aseptic technique and sterile equipment. You might consider, and this is a category II, systems with preconnected, sealed catheter-tubing junctions. Many people are already using these, and those prevent those inadvertent disconnections, and also obtain urine samples aseptically.

In terms of maintaining unobstructed urine flow, some of the specific recommendations are to keep the catheter and collecting tube free from kinking, to keep the collecting bag below the level of the bladder at all times, but not resting on the floor, and emptying the collecting bag regularly using a separate, clean container for each patient, ensuring that the drainage spigot does not contact the nonsterile container.

The quality improvement programs that I mentioned are meant to enhance the appropriate use of indwelling catheters and reduce the risk of CAUTI. They are pretty much essential to ensure that the right things are being done. Some of the examples that have been shown to be effective in the literature are things like alerts or reminders to remove unnecessary catheters or stop orders. Some facilities have used those successfully. Protocols for nurse-directed removal of unnecessary catheters is another strategy that has been used effectively, and guidelines and algorithms for appropriate perioperative catheter management. There may be others, but these are just the ones that have been published.

This is just a table of some of the studies that have shown success with a lot of these quality improvement programs. There are various ones, some of them targeting removal, some of them targeting things like proper insertion and hand hygiene, nurse-directed rounds, and things like that. There is a variety of different programs or interventions that have been shown, and in the third column where it says "CAUTI rate (baseline)," these are the rate reductions that these studies achieved. You can see there is a very rough correlation between the reduction achieved and the baseline rate. Obviously the higher your rate that you start with, the more improvement that you can potentially make, and that does seem to be apparent in many of these studies. Many of these studies did not look at device utilization ratios specifically, but they looked at mean duration of catheterization, which is in the last column, and they also were able to achieve a reduction in the duration in terms of days. Again, in parentheses are the baseline durations that were in these various settings. As I mentioned before, despite reducing catheter days in these studies, they also were able to see reductions in rates. In these cases, the denominator issue didn't really play out that much, but in some cases, it might. I will discuss that a little bit more later.

Moving on to the supplemental strategies, this is just another schematic like the first one I showed you. These are the supplemental strategies that many people have been using and have a little more evidence behind them, but not quite enough to put them into the core strategies. They are under the same category, so under "catheter use," there is the consideration of using alternatives to indwelling urinary catheterization, specifically condom catheters in male patients or intermittent catheters in chronically catheterized patients or post-op patients with urinary retention. The use of portable ultrasound devices is another one that is a supplemental strategy. In terms of maintenance, the use of surface-modified catheters, or antimicrobial/antiseptic-impregnated catheters. Underlying that again in the middle are the core strategies. Before you jump the gun and decide to use something that may be borderline helpful or may not have the best evidence behind it, or may be logistically very difficult to implement, you have to make sure that you have covered all your bases in terms of the core strategies. Just to give you an example, as I have seen firsthand, and I am sure many of you have as well, it is not uncommon for untrained personnel to be given the responsibility in hospitals of inserting urinary catheters. There may be people who are nurses' aides or nurse techs [who] are given the responsibility but not given the proper training to do so. They aren't given the training in aseptic technique and hand hygiene, and frankly, they don't have the training necessarily in anatomy to insert catheters. This is a common practice as nurses are getting busier and have less time for patient care, and some of these patient care activities are getting allocated to people who don't have the proper training. Go to the wards and see what's happening. If you are noticing a problem with your catheter-associated UTI rate and you think this may be a problem related to insertion, for example, before you jump the gun and decide to implement a new type of catheter, a new type of antiseptic or something like that, take a look and see who is inserting the catheters, do they have the proper training, and what programs are in place to make sure this is happening. I just want to emphasize that.

Some of these supplemental strategies can be very helpful, especially in certain patient populations. Alternatives to indwelling catheters, such as intermittent catheterization and external catheters, have been shown in some studies to be useful. Intermittent catheters in patients with neurogenic bladder, like those with spinal cord injury or children with myelomeningocele, have shown some benefit from these, and postoperative patients with temporary urinary retention, for example. These can be combined with bladder ultrasounds scanners, if you have a program that can be put into place. Consider external catheters, specifically for cooperative male patients. I have been told that this is an oxymoron, but in the studies that have been done specifically in nursing home residents, male patients who are cooperative can do very well with external catheters.

Bladder ultrasound, as I mentioned, to reduce unnecessary catheterizations can be very helpful. The data are primarily in neurogenic bladder patients undergoing intermittent catheterization in rehab centers. These particular studies were underpowered. They did not find differences in UTI, but they did find reduced numbers of catheterizations, so that most likely would result in lower risk of UTIs. There are also some data involving QI programs with nurse-directed protocols. Just remember that if you implement a program of bladder scanners, just like any shared medical device, there has to be a system in place for these to be cleaned and disinfected properly in between patients, and nurses need to be trained in their use.

For antimicrobial/antiseptic-impregnated catheters, we say to consider using these if rates have not decreased after implementing your core strategies for use, insertion, and maintenance, and to ensure compliance with these again. Basically, the summary of data on these catheters is that they have been shown to reduce the risk of bacteriuria, and mostly asymptomatic bacteriuria, but they have not been demonstrated to reduce symptomatic UTIs, primarily because studies haven't been powered or designed to show a difference in symptomatic UTI or other clinical outcomes. They also seem to be most effective for short-term (less than 1 week) catheterized patients. There have been mixed results in observational studies in hospitalized patients. Some studies show a benefit; some studies have shown no differences. The control catheters that are being used, in terms of whether they are using latex or silicone catheters, seem to make a little bit of a difference in terms of what these studies have found. There [are] just not enough data to recommend these as a core measure.

The strategies that are not recommended for CAUTI prevention are things like complex urinary...

Charles Denham: Dr. Gould, I know that Dr. Saint has to leave on the hour, so maybe 2 more minutes, and then we can come back during the Q&A period on the end slides, if you want just take 2 more minutes. I know...

Carolyn Gould: Oh, sure.

Charles Denham: ...on the hour, so...

Carolyn Gould: No problem. Thank you. I will just skip this slide. One thing I wanted to mention is we don't recommend screening for asymptomatic bacteriuria. That particular [criterion] has been removed from the NHSN definitions of UTI. We don't recommend doing that except in specific clinical situations. I already mentioned the metrics that are recommended, and this is just the website to go to the CDC/NHSN definitions. This is just a screen shot of the recording form. I am not going to get too much more into the metrics. I already mentioned the denominator issue, and since we are short on time, I just want to mention again that when you are recording your rate or you are looking at your rate, just remember to look at it in the context of your urinary catheter utilization. This is just a website I mentioned before and the toolkit that we put together, and they are open to the public. You can take a look at them there. Additional resources were already shown. Most of these, I think, are on the TMIT website. That's it. Thank you very much.

Charles Denham: Great. Thank you so much. That was very rich, and we really appreciate the references to the resources and being able to have access to those. That is terrific. Thank you so much.

It is my honor now to introduce Dr. Sanjay Saint, the Director of Patient Safety Enhancement Program, Ann Arbor VA Medical Center & University of Michigan Health Systems. He is also Professor in the Department of Internal Medicine at the University of Michigan Health Systems. Sanjay, thank you so much for taking us up to the hour. You can go 5 minutes after the hour. I know you have a pressing engagement and can't be in Q&A, but please go to 5 after if you can.

Sanjay Saint: Thanks very much, Dr. Denham. It is really a pleasure to be with all of you over the phone. I would like to just underscore some of the comments Dr. Gould made regarding the practices, and then focus my remarks on how to translate research findings into everyday practice.

Just a word on background. Importantly, healthcare-associated infections can be prevented. In fact, a conservative estimate is that at least 20% of these episodes could be preventable if evidence-based recommended practices were used. As most of you know, Medicare no longer reimburses U.S. hospitals for the additional costs of certain infections, including catheter-associated urinary tract infections. As I will show you, preventive practices are variably used across the United States, and I believe that infection control is a good model for understanding translation, both in terms of translational successes, translating research into practice the way it should be, as well as translational failures. I will first just highlight some of the practices that Dr. Gould already discussed, and then focus on translating research into practice.

These are the 4 key ways of preventing CAUTI. We will go through these briefly one at a time. I think rule #1 is to make sure the patient really, really needs the catheter. Unfortunately, several studies, this being the best by Jain and colleagues, have found that patients often receive the indwelling catheter for unjustified reasons. In fact, 20% of the time when a patient is first catheterized, it meets no appropriate indication. At the time of this study, they were relying upon the 1983 CDC guidelines in terms of indications. When they then followed patients every day of having a urinary catheter, up to half the days did not meet a valid indication. The question is, why are catheters used inappropriately? We believe that one reason is that physicians and students are often unaware that the patients that they are responsible for have an indwelling catheter. Medical students were unaware 18% of the time when the patients that they were following had an indwelling catheter, but we knew the catheter was there because we could see it. House officers were unaware 25% of the time, and attending physicians were unaware 38% of the time.

The second important approach is to adhere to general infection control principles. Dr. Gould has already talked about most of these. There are websites that could be useful in educating people who are inserting the catheters both in male patients as well as female patients. The key goal here is to avoid contamination of the sterile catheter during the insertion process, and as Dr. Gould said, some people who insert the catheter may not really have been trained, or if they were, it was not done recently. I think educating and retraining those who insert catheters can be quite useful.

Removing the catheter with alacrity is also very important. In a recent systematic review published in *Clinical Infectious Diseases*, Jennifer Meddings at the University of Michigan looked at the 14 studies that have evaluated urinary catheter reminders and stop orders: written reminders, computerized reminders, and nurse-initiated reminders. When all of the data are pooled, there was a significant reduction in catheter use and a significant reduction in infection, and importantly, there was no evidence of harm, the key harm being in re-insertion of the catheter. We tested a urinary catheter reminder at the University of Michigan. We did not yet have computerized physician order entry, but if people want to modify our reminder, please feel free to do so, since 85% of U.S. hospitals outside of the VA system do not yet have computerized physician order entry.

Finally, considering other methods of prevention, I will not dwell on these things. Dr. Gould did a very nice job of talking about when to consider alternatives to the indwelling catheter, and also when to consider the use of antimicrobial catheters, perhaps in those at very high risk of infection or those in which the above strategies have not proven to be as successful as you would like them to be.

Not only has the CDC come out with guidelines, but there have been other recent guidelines on CAUTI prevention. In October 2008, a relatively concise set of guidelines, one of which focused on CAUTI, was published in the *Infection Control and Hospital Epidemiology Journal*, only 10 pages. APIC has also put forward a very useful guideline on CAUTI, 41 pages. A similar-length document was just published, led by Mack Hooton and other colleagues. It was a document that was supported by the Infectious Disease Society of America. Dr. Gould has already discussed the granddaddy of them all, the HICPAC guidelines, that updated the 1983 guidelines.

What I thought could be helpful, since I don't expect many of you to read all of the guidelines, is to give you a concise summary of what they have recommended. I would say that, for the most part, this is what is in common in all the guidelines. First, adhering to infection control principles in terms of aseptic insertion, proper maintenance, education, feedback, hygiene, etc., is clearly very important. Bladder ultrasound may avoid indwelling catheterization, and condom and intermittent catheterization are different techniques that could be useful in appropriate patients. Do not use an indwelling catheter unless you must, and finally, early removal of the catheter using a reminder or stop order appears warranted. As luck would have it, if you actually write out the recommended practices in this order, it is really easy to remember, because it is the A-B-C-D approach to preventing CAUTI. In fact, of these, I would say the adherence and avoiding the indwelling catheter and early removal probably have the most strength of evidence behind them.

That is just to kind of re-emphasize what hospitals should be doing to prevent infections. Let's ask the question now, what are hospitals actually doing to prevent CAUTIs? We conducted a national survey of U.S. hospitals, and we focused not just on CAUTI, but also central line-associated bloodstream infection and ventilator-associated pneumonia. We surveyed over 700 randomly-selected hospitals in the United States, both VA hospitals as well as non-VA hospitals. The lead infection control professionals filled out the survey. We got a terrific response rate. For urinary catheter-related infection, we found that 30% of U.S. hospitals were using either bladder ultrasound scanning or antimicrobial catheters, 14% were using condom catheters in men, [fewer] than one in 10 [is] using a urinary catheter reminder, and still three percent of hospitals were using a practice that is no longer recommended, and that is antimicrobials in the drainage bag.

In general, we found, frankly, that even though CAUTI is the most common nosocomial infection in the United States, there really was no common strategy employed by hospitals to prevent UTIs, and less than 10% of hospitals are using something that has pretty good data behind it and has a lot of face validity,

that being catheter reminders or stop orders. The next step is really to understand why. Why are interventions used in some hospitals, but not in others? We conducted a mixed-methods study that included both a quantitative phase, the survey I have already described, but also a qualitative phase. Qualitative research actually allows us to understand variation and why things are happening one place but not somewhere else. As part of the qualitative assessment, we interviewed hospitals from across the United States. We chose 14, and then we made site visits to six of them. We ended up interviewing almost 100 individuals at these various hospitals: the CEO, directors, associate directors, chief nursing executives, chiefs of medicine, chiefs of staff, mid-level managers, as well as front-line practitioners, both nurses and physicians. What we were hoping to do was first by quantitative methods, understanding what is happening, and then using qualitative methods to identify why certain things are happening. Focusing on UTI, our main qualitative theme is that urinary catheter-related infection is a low priority at hospitals, but timely removal of catheters was considered important. Unlike quantitative analysis where we can rely upon numbers and P-value, in qualitative analysis, the only way I can prove to you that this is correct is through the words of our interviewees. I will now kind of buttress this seam with quotes. A hospital epidemiologist told us, "I nor anyone else has really been able to get ourselves that excited about trying to prevent bladder colonizations, but I think that we probably should try to be more proactive about getting the catheters out." In fact, we found that the hospitals using reminders highlighted non-infectious reasons for catheter removal: patient dignity and mobility and length of stay. There was, however, some pushback from nurses. One nurse said, "Convenience unfortunately is a high priority, especially with urinary catheters. The workload will be increased if you have to take patients to the bathroom or you have to change their bed a little more often." Therefore, nurse buy-in is critical. In fact, a physician administrator said, "Because the nurses on the geriatrics units wanted to have their patients regain mobility, they view ambulation and mobility as a very important goal versus the other units, where the nurses did not necessarily feel that was a real goal in the patient's plan for that day." Therefore, partnering especially with a nurse leader is key, because in many ways, nursing involvement with urinary catheters has been more important than physician involvement.

As Dr. Gould said, avoiding insertion is also very important. An infection control nurse at one hospital said, "Our other barrier is the Emergency Department, and this is where most Foleys are placed. Doctors forget to look under the sheets to say, 'Oh, yeah, there is a Foley there' and the nurses aren't going to take the initiative." Initiatives to avoid insertion at your hospital should ideally include emergency department personnel, and that would be true if you were going to do an initiative to focus on aseptic insertion. If you are a hospital that performs a lot of surgeries, and that is where the catheters tend to be placed, I would say the same thing about focusing on the OR.

There were other qualitative themes that we found in terms of the importance of identifying a committed champion and the use of pilot studies in deciding whether or not to use antimicrobial catheters. Granted, these were data from several years ago that preceded the CMS rule changes. We actually went back into the field in March of 2009 and we have updated the results. We presented some of the findings at national meetings. In general, the rates of use have gone up, but there still does not seem to be a dominant strategy that people are using to prevent CAUTI. The other thing we were concerned about and interested in finding was what about overarching themes. We went into some hospitals and they were doing everything, not just using practices to prevent CAUTI, but they were doing what they were supposed to be doing to prevent central line-associated bloodstream infection and ventilator-associated pneumonia, whereas some other hospitals were not doing those things. We actually were interested in identifying barriers to and facilitators of the use of preventive practices because of this marked variability of practices that were observed. There has been a lot of discussion about variability in healthcare. In fact, it even came up during the healthcare reform debate. As Sir William Osler of Johns Hopkins said over 100 years ago, "If not for the great variability among individuals, medicine might as well be a science and not an art." In fact, what we found is that there are personnel-related issues that could lead to variable adoption of practices.

First, I will give you the not-so-good news – the key barriers of using evidence-based practices at U.S. hospitals. Two of those key barriers clearly involve individuals. The first were people we called active resisters. They prefer to do things the way they have always done them, for the simple reason that it has always been done that way. While we had both physicians and nurses in this category, this tended to

mostly be an issue of physicians, especially surgeons and anesthesiologists. Fortunately, however, we did find some approaches to overcome active resistance. The second and the more challenging group of people to deal with were individuals that we called organizational constipators, who are mid- to high-level individuals who said the right things at meetings, they nodded their [heads] in agreement, but in order to get something moved forward, they actually had to do something, and they didn't do it. You often didn't know that they weren't really behind it for several months, and it was only after something didn't get done. While some hospitals actually erected workarounds so that you could avoid the constipators, after two or three attempts, people would just get frustrated; and then they tended not to even try to move forward because they would have the organizational chart in their minds, and then rather than try to effect change, they would rather do nothing. This is a much more challenging type of individual, but I think just by identifying them, it can be helpful.

Finally, we found that a culture of mediocrity rather than excellence also prevailed at some hospitals or some units in some hospitals, which also was a barrier. I want to just actually talk a little bit about what a culture of mediocrity is not. What it is not is a culture of excellence. We visited two hospitals where there was a clear culture of excellence, where the hospital wanted to be superb, where employees were rewarded for exemplary work through financial and non-financial means. In fact, the employees, when we asked them, they described their hospitals as the best and enjoyed working there even if objective criteria would not support their contention that their hospital was truly the best. There were clear goals that were achievable in these hospitals, as opposed to going from TTUM one year to CQY to Six Sigma to LEAN or the next kind of flavor of the quality improvement month. A culture of mediocrity was quite different. Two of our hospitals we thought had a culture of mediocrity. They were frankly happy to be average. As long as they were not way above or way below and under the radar, they were satisfied. Constipators tended to be prevalent in these places. In fact, in one site, three of the top four individuals in that hospital were likely constipators. It is no surprise that when you ask front-line staff, "Have you gone to your leadership about fixing it?" they kind of shrug or roll their eyes and say, "Leadership is ineffective. What are they going to do?" Over-performers who exist in these organizations are rewarded by more work because they are doing their job plus the job not being done by someone else; and the job not being done by an under-performer, unfortunately, that problem does not get fixed because under-performers are not held accountable for not doing what they are supposed to be doing. Importantly, we actually found within a sea of mediocrity, for example, that there were some units that were truly excellent: a medical intensive care unit with the right manager, nurse manager, and physician manager, they were able to overcome some of the organizational problems. That's the bad news.

The good news is that we also found some key facilitators, and this was really surprising, but it probably shouldn't have been. Effective leadership was key. This applied not just to the CEO. To take a line from Jim Collins' book *Good to Great*, this is about getting the right people on the bus and in the right seats. In this case, it was identifying and supporting the right champions. The champions in healthcare we found tended to work well with other disciplines: internists who work well with surgeons, docs who work well with nurses, and vice-versa. We found examples of prospective leaders among infection preventionists, hospital epidemiologists, chief medical officers, and others.

The key behaviors of effective infection prevention leaders we found were fourfold. First, from a transformational leadership perspective, these are individuals who cultivated a culture of clinical excellence in their unit, by developing a vision and conveying that vision to staff. They tended to be inspiring. They motivated and energized their followers. While some were clearly charismatic, not all of them were, yet they were still successful in doing that.

From a transactional point of view, these were practical leaders. They were solution-oriented. They focused on overcoming barriers rather than whining and complaining, and when there was a resistant staff, they called attention to that and they tried to confront that directly. While they had their eye on the ball in terms of a strategic point of view, they did act locally. They would plan ahead, and one of the things that we heard about from a couple of sites is that they tended to politic before crucial issues came up for a vote in a key committee. Rather than leaving it up to chance, they would talk to the key people on that committee to make sure that something would pass. Their focus was on improving patient care. If they

came to an impasse, we heard stories about how some of these individuals would say, "If this were your family member, what would you want to see happen?" That would often cut through a lot of the red tape.

The other key facilitators we found were collaboratives. 100,000 Lives Campaign, Keystone in the state of Michigan, and others which tended to align clinical silos and goals. The tools used by collaboratives tended to include having a CEO buy in to the problem, spotlighting a particular issue, identifying a champion within the organization, and then using off-the-shelf solutions that have been developed elsewhere and adapting those solutions to your own institution.

Finally, let me just say that, as Dr. Gould said, there are several collaborative efforts currently underway across the United States to prevent CAUTI. We are evaluating the Bladder Bundle here in the state of Michigan. I know North Carolina and other states are also moving forward. Importantly, though, while we have some evidence of what works and what does not work, and we should therefore then implement those things that appear to work, there still is an important need to improve the evidence base through observational, interventional, and economic studies. Of that majority of the recommended practices within the HICPAC guideline, if it was recommended, it was IB, not IA, so we don't have some very high-quality studies with robust evidence from many different practices within this field, and we still need to do that.

Finally, I think it is important to realize that implementation is unlikely to be a one-size-fits-all strategy. As we are evaluating the rollout of the Bladder Bundle here in our state, we are realizing that different hospitals have come up with different approaches to actually implement the evidence. So even within the same hospital, one unit may decide to implement their approach differently than another unit. I think that this type of tailoring of the implementation process makes sense. Perhaps the most important thing that I can leave you with is that preventing catheter-associated urinary tract infections is a team sport. This is not going to be a problem that just infection preventionists can fix or hospital epidemiologists or physicians or nurses or administrators. This really does test our ability to work in an interdisciplinary manner because so many of these interventions will require behavioral change, and behavioral change from many different members of the healthcare organization. Thank you very much.

Charles Denham: Sanjay, if you can stay on for just two or three more minutes, because I know you have to leave, I will ask you just to give us some very clear direction on what certain players need to know. I am going to ask you three questions. The first one is, what does the board of a hospital ... we are building a board portal and a whole mechanism to get quality information in front of the non-clinical board members. Can you tell us what board members need to know that they don't know, and what questions should they ask? Then I am going to ask two other players and will let you go. So board members: what do they need to know that they don't know, and what do they need to ask?

Sanjay Saint: If I understand your question correctly, Chuck, I would say that ideally you would monitor your rates of CAUTI, and I know Dr. Gould has talked a bit about what metrics to use. I would recommend that the rates that the CDC recommends be looked at in terms of numbers, CAUTIs per 1000 catheter-days and device utilization ratio, but I would also recommend that perhaps an additional rate be looked at, and that would be number of CAUTIs per 10,000 patient-days, because paradoxically, if the focus is on avoiding the indwelling catheter or removing it sooner, you may end up seeing an increase in your rate if your denominator is catheter-days. So, number one, I would say the board needs to monitor some rate of the important outcome as well as the process. The second question I would have the board ask is, do we right now remind physicians or have some type of a stop order where we remove the catheter after a certain amount of time, and if we don't, why don't we? Because not only are there infectious reasons to get rid of the catheter, and that is the focus of [recording cuts out], there are also compelling non-infectious reasons. We've called the urinary catheter a one-point restraint, because it [recording cuts out] the patient to the bed, preventing [him] from moving, increasing [his] risk of developing decubiti or DVT, and increasing [his] risk of deconditioning. Patients tend not to like to have a latex or silicone tube put in their bladder. So I think that early removal of the catheter for both infectious and non-infectious reasons makes sense.

Charles Denham: The second question is, are we also really going to reach out to consumers to have them help champion the cause of quality and safety in their communities and local hospitals, but so many

are caregivers of others. What should a nonclinical consumer ask when they have their elderly mom or their dad or their child or their husband come to a hospital? What is the appropriate thing to ask the caregivers?

Sanjay Saint: Do they really need the catheter, and can the catheter be removed today? Ideally, we would not like to have our patients and their families kind of shoulder this burden. Ideally, a system-based approach would be what would be instituted so that we would be just reminded that the patient has a catheter after 24, 48, or 72 hours. I think until we are there, I think having patients or their families, especially in this case, because a lot of the patients who receive an indwelling catheter have cognitive impairment or are confused, and they may not actually think about asking whether or not the catheter can be removed, but the caregiver [recording cuts out] can.

Charles Denham: Great. And then, the last thing is, if there was one thing that hospitals out on the front line would really need in terms of tools or resources, what would it be?

Sanjay Saint: Well, I would say they would need a couple of things. First, they would need high-level support from someone who is the über-champion. The chief medical officer, chief nursing executive, maybe even the CEO who says, "You know what? This is the right thing for us to do. Not only is it the right thing from a cost point of view since we will no longer be reimbursed if the patient develops a CAUTI on our watch, but more importantly, this is the right thing for our patients." And that individual would then task a champion or two, and I would say two champions are probably better than one. One is a nurse and one is a physician who can speak to their respective disciplines about the importance of this and who can kind of focus on the details of how to put these things in place. Just to be clear, preventing CAUTI in my opinion will be much more challenging than preventing central line-associated bloodstream infection. We do not have, in CAUTI, the equivalent of chlorhexidine gluconate in the catheter tray. Many of you are familiar with preventing CLABSI and how chlorhexidine can decrease the risk of infection by 50%, based not only on randomized trials, but net analyses and formal economic evaluations; and once they replaced povidone iodine with chlorhexidine gluconate, that was a key step. We don't have anything like that, so because this is more behavioral and less technical, it will require individuals who decide that this is the right thing to do.

Charles Denham: Well, listen, Sanjay, thank you so much. You have really been terrific. We are going to move on. However, the folks [who] have questions are going to submit them over time. We collect all the questions and we may loop back with you on our transcripts. You have always been such a terrific national leader and so helpful to others. Thank you so much. I know you have to leave before the Q&A, but we are very grateful your time.

Sanjay Saint: Thanks, Chuck.

Charles Denham: I would like to invite now Jeanette Harris, who is going to address rapid-cycle improvement, and she is from the Infection Prevention and Control MultiCare System. She will be providing also a colleague to help with the Q&A section. Jeanette, please take it away.

Jeanette Harris: OK, thank you. I just want to apologize. I have lost my handset, so I am speaking over the speaker phone. Let me know if I am not coming through very well. I work at MultiCare Health System. We are a four-system hospital in Tacoma, Washington, and we started in on our UTIs in 2007. We found that 35% of all hospital-acquired infections were UTIs, and knowing that CMS was going to start not reimbursing us in 2008, we decided to give it a shot and see if we could do something about it.

The first thing we did was some financial analysis, and we discovered actually here, in our own system, that each UTI costs over \$7000 with 6.9 average extra days. We decided that we were going to give it a go and see what we could do. We developed a UTI bundle of our own, just by doing research and figuring out what others had done, and we have been quite successful, we have discovered. The good news is that there are unintended consequences, and all of them have been good, so that's another good thing.

The first thing we did was identify what the problem was. We have a data mining program, so we have actual hospital-wide, system-wide surveillance capability, which is an added plus. This is our one hospital here, it is Tacoma General. It is an adult facility. We had a large increase in July of 2007 in our UTIs, so that was another impetus that it was time to do something about it. We analyzed it. We had a number of UTIs. We also discovered we had a lot of Foleys being used, and they were just left in. Sometimes there wasn't even an order. Sometimes it was in and nobody even bothered to take it out. Patients actually went home – one patient went home with one in already and nobody discovered that. So they weren't following insertion practices. When we did a survey of what kind of insertion practices were actually happening, it was enough to curl your hair when you found out what was going on. Then, there was no maintenance. We did institute a silver-impregnated Foley in 2006, and we had a slight reduction when we went back and looked at that time. What we discovered when we did surveys and talked to the nurses is that they assumed the silver Foley was a silver bullet, so there was no maintenance done, and they just figured that the silver Foley was everything they needed to do. As it turns out, it was not. So you can't just do just that one thing.

The other thing is urines were collected, and they were collected aseptically and put in a cup, and by the time they got to the lab and were actually plated, it was over an hour. I am a microbiologist, and anybody who knows how *E.coli* can grow and overrun a urine, all you need to do is open a cup after it has been sitting on the counter for over an hour, and the lid practically explodes with the gas that has built up on the inside of the cup. It wasn't that anybody had just left things sitting around, it is just the cumulative time from the time of collection to transport to waiting for plating was over an hour, so we addressed that, too. We used a PDSA system of Six Sigma in order to do this, and we have our electronic surveillance, like I said. We use that for tracking and reporting. We picked just one trial unit. We didn't do this system-wide. It was not a lot of meetings. In fact, there was one day I ran the report and I was shocked at the number of UTIs, and I ran that report directly to one unit. They were, you might say, the top performers for UTI in that they had more UTIs than anybody else. I ran up there and said, "Take a look at this." The director who is on that unit said, "Holy cow! We need to do something." I said, "OK, let's get started." So with that one thing, the very next day were staff meetings. We explained to the staff, this is what you've got, here's something that we can get started on, and they were not 100% behind it. You know, there was a culture on that unit that was not the best, but that's okay. I always tell people when I talk about this, don't pick the easy ones. Pick the hard ones, because they are the people who have the most problem, and if you're gonna get a reduction that makes the biggest change, the biggest difference ... So that's what we did. We started with a UTI Bundle. We studied it to kind of see what was working and what wasn't working, and the next thing was to change something if it wasn't working. So this is our bundle.

On one unit, we started this where we looked at clinical indicators for patients who walk in the door with a UTI. What we were discovering is that patients did have UTIs when they came in to this unit, but we didn't find them until day three or day four, so we had to count those on our count. So what we wanted to do was to find them first and foremost. We used the symptoms for UTI. Not every patient gets a culture – only those patients who meet the criteria of possible UTI. We didn't get the physicians involved in this because there are a whole lot of committees and meetings, and we just wanted to get started. We wanted to hit the ground running. So this is a nurse-directed initiative. When the nurses do their admission assessment and they think a patient has a UTI, the first thing they do is collect the urine. They put that urine in a tube with a preservative in it to keep bacteria from growing further, and then they call a physician and say, "I think this patient has a UTI. I want to send this urine culture if indicated." What we discovered is that there is not a physician on the planet that will say, "No, I don't want to do that. Throw that urine away." So they sent that to the lab, and that means that there is another pair of eyeballs in the lab that is looking at the urine. If it meets criteria for setup for culture, then it is done.

We do not put Foleys unless it is absolutely necessary for all of these different reasons. Very often when I talk about this, people will ask, "What is the single most important thing to stop UTIs?" It is just that we don't put a Foley in in the first place. They will say, "What about other things?" I say, "If you don't put that Foley in, then you don't get the UTI in the first place."

So this is the rest of it. Hand hygiene – we have a very robust hand hygiene program here. We monitor actual product usage and using the Partners in Your Care formula for that. We did a lot of education for

aseptic insertion and maintenance techniques. We have unit educators, and we got all of them involved. Maintaining the urine drainage bag below the bladder – you know, it's just everything that all these nurses have learned in nursing school, but the problem is that they weren't doing it. So we just had to reinforce all of that. We did do something different with peri-care. You know, it's like you can't not clean the area, so the first thing you do, before you put a Foley in, you have to clean the patient up. This one unit that we started with, many of these patients in here have fallen and broken their [hips], and sometimes they have [lain] in their own excrement for a number of hours, so you have to clean people up first and foremost. A lot of these patients are homeless too, and they haven't seen a hot shower in months. We need to clean them up first and reduce the bio-load on their skin. Then you use perfect insertion technique, and we did a lot of training in that regard, and use a securement device. Then we always ask every day – in fact, every shift, somebody is supposed to ask the question – “Can we take it out now?” So this is what we did. Current rates were unacceptable. We changed it. Learning lab, maintenance, hand hygiene, and look at that. It was amazing. I had no idea. I told them, “If we can just get a 10% reduction, that would be significant, and I would be more than happy with that.” September was amazing. I nearly ran down the hall with the report when we first got it, shouting and yelling up on the unit. Then we hit November, and you can see that on the far right-hand side, it went way up. I couldn't figure out what was going on, so I looked at it on a weekly basis, and as it turns out, we had a lot of UTIs during the week of Thanksgiving. So I went up to the manager up there and said, “What does this look like? What's going on here?” She says, “Oh, well, we have a lot of agency people during the week of Thanksgiving.” I said, “Well, there it is. We didn't bother to share the information with everybody.” So we did some additional training and additional education, and lo and behold, December was a zero. This is the very first time this unit has ever hit zero. It was totally astounding. I ran the report multiple times just to make sure that I didn't miss anything. This is when we started using the gray-top tubes with preservative in it, and that's when we started getting some pretty consistent zeroes on this unit in particular. As you can see, January went up again. The blue area is the patient days, because I wanted to see if it had anything to do with number of patient days on this unit, and it had nothing to do with it at all. It is something that you have to constantly talk about and visit and share the information. It's like spaghetti on the wall – the more times you throw it against the wall, the more stuff is going to stick. You can see that we've had some pretty consistent zeroes starting in 2008, right away. We wanted to push this out to other units. We started with just one unit, and right now, we have it in three full hospitals, every inpatient area, every ED area, and in the fourth hospital, they are just beginning this. They have five units in the process right now.

I did some math after the first six months, because you never know if it is really working or not. I mean, the numbers look good, but I wanted to do some math. I submitted this to SHEA as a poster and it was accepted, so you can see that we had a 273% improvement with a pretty significant P-value there. When we run the numbers, and that is one of the things I made very certain that staff learn, was that UTIs are not free. They do cost. They have additional costs, and starting in 2008, we weren't going to get reimbursed, so I let everybody know just how expensive they are. As of June of this year, we have 23 full units doing this. We have added five more in July and in August now. So you can see the cost savings is quite significant, and every time I run these numbers, I nearly hit the floor. We do share this with our CEO, our CFO; the C-suite is well aware of this. It is just so much fun to give them good news.

Other important rewards for not just the hospital, but for this unit in particular – we changed the culture in the very first unit. As I said, they had a high turnover rate, they had a lot of agency people. It was a unit that nobody wanted to work in. The best thing about this is that we have been able to change the culture in this unit and they are high performers now. In fact, they have been called “the innovation unit,” where they will try anything new and are totally engaged. It was just a significant change with them.

Lessons learned: You've got to measure it. You can't fix it if you don't know about it. We do have huge support from our administration, from the CEO on down. Everybody is involved. The best reward I ever received with this was when I got into the elevator one day, and one of the nurses was in there and was headed up to our unit. She said, “Jeanette, I haven't seen our UTI report yet this month. Is it ready? Do we have any?” I said, “Well, it is just the 2nd of the month. I haven't finalized the previous month yet.” She said, “As soon as you get it, let us know, because we want to know what's going on.” I do not report rates to individual units. I give them real numbers. Most bedside nurses and most bedside caregivers, and I'm talking LPNs to CNAs, they don't understand rates. Give them real numbers. When a unit does have a

UTI, I give them a line list with name, medical record number, and we figure out what happened. What we have discovered is that there are education holes, so we plug all those holes that we possibly can. We give them patient stories, tell them what is going on, constant, constant feedback, and I always add the dollar sign to that – how much we have been able to save because of that. That's it.

Charles Denham: Thank you very much. It is clear that the procrastinators were overcome in your organization. It is my honor to introduce Denise Graham, who will now give us an overview of the APIC support. She is Executive Vice-President of the Association for Professionals in Infection Control and Epidemiology.

Denise Graham: Thank you so much, Chuck. As discussed throughout today's webinar, UTIs have really been a longstanding issue within the IP community. From an international association, we can speak to that both on a national and international level. Certainly this has been the subject of numerous articles within medical journals, as well as the mainstream press. I think all of the attention that this is getting serves as the impetus and determination needed to really implement the advancements that we have heard today in the call into curbing and/or eliminating the UTIs. I wanted to just talk a little bit about APIC's expansive arsenal of products designed to tackle these infections.

What you see on the screen right now, looking at the middle icon, *The Guide to the Elimination of CAUTIs*, is an elimination guide developed in tandem with the CDC. So our infection preventionists are always looking to translate the science that comes out of the CDC's scientific guidelines, and put them into a more how-to implementation approach. That guide that you see right in the middle there will provide you the step-by-step how-to approach from the CDC guide. There is a free download for both members and nonmembers of APIC, and it is the link that is at the very bottom of that screen, that pretty long link that clearly delineates that it is the APIC elimination guide. I know Dr. Gould may have had to get off of the webinar, but we do want to thank her for all of her time in providing review of this implementation guide. I also want to tell you that joining me on today's call is Marilyn Hanchett. As of mid-June, Marilyn joined the APIC staff as APIC's Senior Director of Clinical Innovation. She has a very impressive background which includes an RN degree, as well as certification in Infection Control and an in-depth understanding of healthcare in a variety of settings, including the regulatory process. She actually was employed by the Centers for Medicare & Medicaid Services for a period of time before coming to APIC. Further, she has greater than 20 years experience of performance improvement, so I really have her on the call today to assist those of you who have questions about the implementation side during the Q&A section, since I am not a clinician. We can continue with this webinar since time is running short. I will just speak quickly to the IP program evaluation tool that is up there. That is a tool which is on CD-ROM which identifies and properly assesses needed resources for infection prevention and control programs. It gives you some tools to assist in communicating the findings once you have completed this grid to help you obtain some necessary support. Any questions about that, feel free to reach out to me. Then, of course, the APIC text. What I have shown you there is what we refer to as our bible of infection prevention and control. It also comes in an online version.

To proceed with today's webinar and to move into the critical Q&A, I am going to just end this right here and thank all of you who participated, in particular Dr. Denham and your team. Dr. Denham, bringing this group together, this type of activity with clinical experts such as yourselves, it really brings all of us closer together and making progress towards eliminating UTIs. Thanks so much for including APIC and for your time.

Charles Denham: Great. Thank you so much, Denise. It is wonderful that we have this group to answer some of our questions. We are excited that in the next 2-3 months to announce that we will be also releasing an impact calculator that we have worked with to help update APIC's impact calculator of a few years ago for all of the healthcare-associated infections. APIC has been a wonderful partner, and we can't wait to be able to give that away to the national marketplace, which APIC will do and TMIT will do as well.

Moving to our questions, we had two or three questions regarding bladder training. One question was, "Once patients reach a nursing home, there has been the practice that quotes bladder trained by intermittently clamping and releasing the catheter prior to removal. Is there research to back this

practice?" The second part of that same question from another one of our viewers is, "Our doctors sometimes order bladder training before catheter removal. This involves clamping the tubing intermittently. Is this inadvisable or advisable?" We will loop back perhaps if Dr. Gould's still on, and then ask Jeanette to respond as well.

Carolyn Gould: Sure. I'm still on. We did find a little bit of data asking that question, and it didn't look to be at least necessary to do any kind of clamping prior to removal, but it is very limited. We didn't even have enough data really to address it in the guidelines. I would say the short answer is no, there [are] really no data to back it up.

Charles Denham: OK. Are there any comments that you want to add, Jeanette, regarding this issue of bladder training and clamping?

Jeanette Harris: You know, we don't do that. We don't have any long-term care facilities in our system, so we don't do any of that.

Charles Denham: Gotcha. I think in the future, as we continue to work with our nursing home participants with TMIT, that we will be broadening some of these issues, because the readmission from nursing home back to hospital is an area that we are focused on with one of the other Safe Practices, and this becomes an issue. One question was a Murphy drip – is it considered a Foley? Anybody want to answer that?

Carolyn Gould: I'm not sure what that is.

Charles Denham: The questioner should just maybe expand the question and monitor that coming in. Another question is, "Everyone accepts that urinary incontinence is not an indication for catheterization, but some patients can't be kept dry any other way. How do we balance the risk of infection against the risk of decubitus ulcers exacerbated by continuous urine contact with the skin?" Dr. Gould?

Carolyn Gould: You know, that's a great question. We tried to address that. Again, it is a scenario that has very little information to guide us. We did identify it as an area requiring more research, so we are really trying to support and promote those type of studies. I think there are obviously a lot of nursing issues surrounding that question in terms of skin care and keeping a patient clean and dry without a catheter. I think one thing that we really need to focus on, as we talk about sort of engaging nurses in this process, is to provide alternatives for how to manage these patients without catheters. I think maybe our partners, APIC and others, might have more insight into this issue as well.

Charles Denham: Anything you'd like to add, Jeanette or Denise or Marilyn?

Jeanette Harris: Actually, when we do have patients like this, we focus more on keeping them dry. It is not that the urine is so bad for their skin, it is sitting in it for extended periods of time where the bacteria begin to grow. If that is happening, then that's a problem. What you need to do is make sure they are not sitting in old urine, so to speak. We just concentrate on keeping them dry and getting more changes to their bedding and to the pads or whatever they are using. If there are skin changes, then that's a medical reason to have a Foley in. If it looks as though their skin is affected, then it's okay to put a Foley in, but it's the measure of last resort.

Charles Denham: Another question regarding measurement is, "Are there good benchmarks, or should there be benchmarks that we should consider of catheter days per 1000 patient days established?" Dr. Gould?

Carolyn Gould: There aren't benchmarks, per se, and it really depends on the patient population you are talking about this. This is going to vary from unit to unit, obviously. We don't have current benchmarks developed right now, and I don't know if we will. I think the key is the process measure of ensuring that patients that do have the catheters are the ones that really need to have those catheters, and to document that. What you end up with is just going to depend on the patient population you have. We don't have current benchmarks in terms of different patient populations at the present time.

Charles Denham: Great. Next question is regarding the silver-coated Foley catheter. We know the "silver bullet syndrome" of believing that now that you have the silver-coated catheter, less attention may need to be required, which I think is a real interesting point of our panelists. What is your take, each one of you, on the silver-coated and the coated catheters? Dr. Gould?

Carolyn Gould: Sure, and thanks. I am going to have to probably sign off right after this. I was really interested to hear Jeanette's comments about that, because I think that has been a theoretical concern for us, and she found that to be the case, as when they introduced the silver-coated catheter, everything else went out the window because there was a perception that it was the silver bullet. I think that is the only danger – that and the extra cost potentially for a questionable benefit. The key really is, and I don't have any reason not to recommend those catheters, but you have to ensure that you have the basic practices that we know work in place. The main issue with the silver-coated catheters and other antiseptic/antimicrobial-impregnated catheters is they just haven't been demonstrated to show a reduction in clinical outcomes. They do seem to reduce the risk of bacteriuria, they do inhibit biofilm *in vitro*, so there is a rationale that at least in the short term, less than a week or so, they may reduce the risk of bacteriuria. But it is not likely to help if you're not following the basic measures of aseptic insertion and maintenance.

Charles Denham: Great. We will be wrapping up right now, but Dr. Gould, before you leave, one question was, the NHSN guidelines do not address the issue of the elderly, who may have another indication of infection. Example: No increase in temp, but mental status changes. Do the caregivers simply stick with the NHSN guidelines as an indication of infection vs. symptomatic for the elderly?

Carolyn Gould: That's a really great question.. When the definitions were modified, that question came up. The only reason there wasn't a separate category for the elderly this time around was we were unable to reach a consensus on what those signs and symptoms should be. However, if any of you are familiar with the McGeer criteria, which [are] criteria used in elderly patients for infection, they are being modified now and they should be published relatively soon. Also, we are working with one of our subject matter experts here in long-term care, Dr. Namali Stone, to modify some of the reporting forms. She is working on CAUTI and *C. diff.* infection right now. Those forms are going to include some of these other signs and symptoms for the elderly. So that is being worked on and soon to come, but I think for now, in the NHSN system, there aren't separate criteria for the elderly, but that is going to change relatively soon, at least for long-term care.

Charles Denham: Great. Well, listen, we have run a little bit over, but you can see we have over 700 lines open and the average 3.5 to 4.5 people per line, so we are so grateful for this great group of speakers and panelists. We'd like to thank them again. There will be transcripts. This was recorded. The slides are available in PDFs, and they will be in various forms of PDF. Some have expressed they wanted to have more slides per page, so we will do that as well. There will be transcripts of this so that one could word-search them, and we will try to answer some of the questions that were unanswered in the dialogue. We always try to open with a patient advocate and close with one, and Patti had a technical difficulty getting the line open. We'd just like to have Patti O'Regan – and we want to congratulate her for recently obtaining her doctorate – nurse practitioner, and more importantly, also a patient advocate, close us with 30 seconds of her words of inspiration, representing our patient advocate team. Then we will close. Patti?

Patti O'Regan: Thank you, Dr. Denham. It is a great pleasure to be here with all of you today. Due to the time constraints, I will eliminate the first few sentences and just go straight to what I consider the meat of it for me. My particular passion is in inviting and involving patients and families to serve on all of your – governmental as well as hospitals, etc. – all of your patient safety and performance improvement committees, particularly those patients or the family members who have experienced a hospital-acquired condition or never event. In this case, it would be the catheter-associated infection, which is both a hospital-acquired condition and part of the NQF Safe Practices. Let me just close by saying that patients and families, particularly those affected by medical errors, hospital-acquired conditions, are a wealth of knowledge and insight that is really truly yet untapped. These patients and families, along with each one

of you on the phone today, are the recipients and the guardians of healthcare tomorrow. Thanks, Chuck. It has been great being with all of you today.

Charles Denham: Thank you so much, and again, thank you, Dr. Gould, Jeanette, Denise, and APIC for being wonderful partners. We thank Dr. Saint for his commitment as well, Hayley Burgess, Kyle Kemp, and our entire team, who [have] been kind of behind the scenes putting these webinars on. We look forward to our next webinar. We will be talking about the toolboxes and the behind the scenes of the documentary, *Chasing Zero*. We are really gratified to have over 3,000,000 viewers, and the following documentary that Dennis Quaid will also narrate. We are very thankful for your support, and we hope you have a wonderful day.