Cyberseminar Transcript

Date: November 12, 2019

Series: HSR&D Career Development Award Enhancement Initiative

Session: Test Smart, Treat Smart: The Journey to Optimizing Bacteriuria Management in Veterans with Spinal Cord Injury and Disorders

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**Rob:** And as it’s just now the top of the hour, I’d like to introduce Barbara Trautner who will be doing introductions for Felicia Skelton-Dudley. Barbara is with the Michael E. DeBakey VA Medical Center. Barbara, can I turn things over to you?

**Dr. Barbara Trautner:** Yes. Hi, I’m Barbara Trautner and I am delighted to introduce today’s presenter, Felicia Skelton. Felicia is a Physiatrist which means Physical Medicine and Rehabilitation Specialist. She completed medical school at Baylor College of Medicine where we both currently work, affiliated with the Houston VA Hospital. Felicia then did her training in Physical Medicine and Rehabilitation at the University of Washington where she was one of their chief residents and then she stayed for another year to do a specific fellowship in spinal cord injury management. It was during this time that we met. She knew she wanted to come back to Houston and she was very persistent, specifically appearing in my office on a visit to Houston, said she’d like to be mentored and she really wanted to study how to optimize care for persons with spinal cord injury. So we said that’s a deal. She came back to Houston. Became a physician at the Houston VA Medical Center specializing in spinal cord injury and also at the same time was a Health Services Research and Development fellow. During her fellowship, she applied for funding from VA Health Research and Development for her Career Development Award which she has received. And I’m really excited that she’s able to present her work today because she’s making a lot of great progress in optimizing care of persons with spinal cord injury. So I’m going to turn it over to Felicia now.

**Dr. Felicia Skelton-Dudley:** All right. Thanks, Dr. Trautner. So good morning or afternoon, depending on where you are in the country. I’m very excited. I’ve been thankful from the opportunity from HSR&D and the Career Development Award Enhancement Initiative to talk about our work today. As Dr. Trautner was saying, I am in the third year now of my HSR&D Career Development Award as of earlier this month. And I’m really excited to share our work that we’ve been doing, kind of the work that’s in progress, and what we hope for the future in tackling this big issue. I was so inspired by Dr. Akins [sic] at the Career Development Award Conference at the end of October about, you know, just looking at the big issues and answering the big issues but trying to answer them simply. And so that’s really the goal of our work and it’s come out of my clinical practice. You know, these are questions and an issue that we face every day in the clinic. And now we’re just trying to, again, be smart about the answers that we have towards them.

Okay. So our objectives for today are as follows. I really want to describe the implications of national and Veteran Health Administration, or VHA policies, surrounding bacteriuria management and how that interacts with our actual clinical practice in taking care of patients with spinal cord injury and disorder. I then want to visualize the unique challenges and opportunities of bacteriuria management in this population. Work by Dr. Trautner and others in VHA and other parts of the healthcare system have really done a great job of highlighting the issues surrounding this in a non-SCI/D population. But I really want to pose to you and really talk through the unique considerations in this population because I think they’re important and there’s not a one-size-fit-all intervention for this population, for sure. We’re then going to talk about some of the previous work that we’ve done on bacteriuria management in Veterans with spinal cord injury/disorder, kind of our preliminary work, trying to tackle this issue. And then we’ll talk about our current work and next steps for the future.

And I have no relevant financial conflicts of interest. But here are some of my related disclosures.

So now we’re ready for our first poll question. And just so that I have a sense of who’s listening in on the call today, just let us know what your primary role in VA is.

**Rob:** And Dr. Skelton that poll is running. Answer options; student, trainee, or fellow, clinician, researcher, administrator, manager, or policy-maker, and other. And we have a little over half of your viewing audience having made their choices. So we’ll leave things open a few more moments. Give people a little bit more of a chance to make their choices. And things have ramped up to a little over 70% so I’m going to go ahead and close the poll and share out the results. Felicia, 11% say that they are students, trainees, or fellows, 56%, the largest number, are clinicians, 22%, the next larger number, researchers, 0 are administrator, manager, or policy-makers, and 11% say other. And so now we’re back on your slides.

**Dr. Felicia Skelton-Dudley:** Okay, excellent. So it’s good to know that there’s a large proponent of clinicians which kind of really feeds into my next question. Here. Yes there we go. And so, I’d like to get a sense of, again especially since there are quite a few clinicians on the call, how familiar are you with the VHA System of Care for spinal cord injury and disorder? With one being not at all familiar you’ve never heard of it, didn’t realize it was something that existed to number five, very familiar maybe you take care of patients with SCI/D or at least interact with the other physicians and providers on that care line.

**Rob:** And that poll is open. Things are moving along a little bit faster this time. I think people are a little bit more sure of how familiar they are with VHA System of Care for spinal cord injury and disorder. And it’s up almost at 80% where it usually levels off so I’m going to go ahead and close this poll and share out the results. And let you know that 10% say that they are not at all familiar, 30% choose number two, 20% choose number three, 20% choose number four, and 20% choose number five. So across the board. And we’re back on your slides.

**Dr. Felicia Skelton-Dudley:** Excellent. Okay. Sounds good. So again we’ll talk a little bit more about the System of Care and how this all interacts with the research that we’re doing. And then obviously the clinical practice, like how that touches the patient and, which is really what we would like to describe today.

So again, antibiotic stewardship as a way to combat antibiotic resistance. This has been a high-level issue on the national and even global scales. Back in 2015 there was an initiative from the White House Administration at that time highlighting the importance of combating antibiotic resistance and the public health risk that that poses. The Centers of Disease Control has put out similar articles and even the United Nations has had a high-level meeting on antimicrobial resistance which is, they don’t do that that often, you know, for public health issues. So it’s obviously highlighting the urgency of this need. And again, for those that aren’t aware on the call, antibiotic stewardship is the whole idea of providing the right drug, at the right dose, the right route so either oral or parenteral or some other route for the route duration. And what we’ll talk a little bit about with the work that we’re doing is that there’s the idea of antibiotic stewardship but also the idea of test stewardship. So making sure that we, before we send a test, that we’re thoughtful and mindful that that’s the test that we really want, that it’s the test that we need. Because we have some pretty good evidence that downstream effects of that test, regardless of what the answer actually tells us, affects how antibiotics are used and other things like that.

So catheter-associated UTI, or CAUTI, and from here on out I’ll use catheter-associated UTI and UTI almost interchangeably and we’ll kind of talk about why that makes sense in the spinal cord injury disorder population. So catheter-associated UTI is a clinical infection, a clinical meaningful infection that’s associated with catheter use in the bladder versus asymptomatic bacteriuria’s when, you know, you have a positive urine culture there may be bacteria present in the bladder but they’re clinically feeling okay. And so there’s this interesting confluence of kind of the policy and then, the policy surrounding these diagnoses and then how we actually take care of patients. And so there’s this whole idea of getting to zero with these catheter-associated UTIs. A lot of health care systems are penalized financially, you know of catheter-associated urinary tract infections are diagnosed and so there’s this big emphasis, a big push, to make sure that that doesn’t occur. Part of that is complicated, however, in that the fact that asymptomatic bacteriuria in people with spinal cord injury are so common. And we’ll talk about some reasons for that here in a bit. So there’s these clinical practice guidelines that show you, that tell you what to do and how to do it and this is how frequently you should be doing. This is what, you know, a clinically meaningful urinary tract infection means in X, Y, or Z population. But there’s also been some data that’s been out for quite some time that physicians have trouble following guidelines. And there’s lots of reasons. They’re long. They can be very complicated. They require you to make, you know, a series of decisions and kind of hold those decisions in your mind until you get to the end to make the ultimate treatment decision and that can be cognitively taxing. So there’s a lot of physicians, you know, they don’t want, they feel like well my population is different, my population is special, and so that they feel like the guidelines don’t apply. And so, there’s a [unintelligible 10:26] article from JAMA back in 1990 by CABANA et al of that kind of describes all of those issues. And so, all of that goes into how we actually treat the patient when they’re sitting in front of us. And the whole idea of what’s recommended, what’s in those guidelines doesn’t always translate to what happens when you’re sitting in front of the patient. And we wanted to explore that a little bit more.

So bacteriuria management in spinal cord injury and disorder has some very unique challenges. And I love this diagram because it hopefully not too overwhelmingly kind of highlights some of those issues. So people with spinal cord injury have neurogenic bladder. Because of the nerve damage to their spinal cord, they’re unable to effectively store urine and empty urine. They have the issue on both sides. And so this leads to the need of having to have chronic catheterization. Either with an indwelling catheter like a Foley or suprapubic catheter or with intermittent catheterization so where they drain their bladder, take the catheter out, and go on about their day. But either way, you’re putting foreign objects into the bladder and so you’re introducing bacteria into the bladder. That leads into kind of bacterial colonization, bacteria that just already lives there. The urine is not sterile in most of these patients and so you get some altered flora, you know, that the good bacteria that usually keep us healthy is altered because of all that. Again, I won’t go through this entire diagram but you can see that there’s a lot of pathophysiology involved in this population which makes it a little bit different from the populations that have been studied most frequently and where, you know, the bladder works you know it still stores well, it still empties relatively well, and the need for chronic catheterization is not completely clear.

Okay. So catheter-associated UTI in people with spinal cord injury and disorder is extremely common for that reason. It’s, most people with spinal cord injury and disorder are going to have at least one UTI over the course of a year and many will have multiple. It’s extremely costly as I’ll describe here in a bit, and it’s confusing. I think we underestimate the cognitive challenge in diagnosing true catheter-associated UTI and UTI in this population because of some of the reasons we just talked about.

So this is work that I completed with my research team here. And diseases of the genitourinary tract are amongst the most common reasons people with spinal cord injury and disorder access the health care system. And so we looked at a retrospective cross-section and cost analysis using the National Inpatient Sample and the National Emergency Department Sample from the Healthcare Cost Utilization Project, or HCUP, and we went back to 2006 and 2015 because that’s, 2015 was the most recent data that was available at that time. And so, we looked at spinal cord injury/disorder related encounters using ICD-9 codes. And over that time, we had over a million hospitalizations. And the top three reasons for admission were septicemia of which, you know, urosepsis would be included in that situation, ongoing rehabilitation care, again which is a, I think a unique admission cause for this population, and then urinary tract infections rounded up the top three. The emergency department sample we had over 600,000 just treat and release visits, so they presented and then were sent home. And again, urinary tract infection was the number one reason for that occurrence and then genitourinary symptoms and ill-defined conditions, and then complication of a medical device, implant or graft which often meant the catheter. So something related to, you know, how folks empty their bladder and manage their bladder are the top three reasons that people present to the emergency room.

And it’s costly, it’s expensive. If I haven’t impressed upon you the dire need to effectively manage this, this condition in this population, hopefully these numbers will drive that home. Again so total cost for encounters associated with any genitourinary complication exceeded two billion per year. And so that’s what the areas in the dotted parts of the pie graph show. With the majority of those costs coming from inpatient stays. So it’s a big issue, it’s a costly issue. Spinal cord injury disorder is a relatively low incidence but extremely high-cost condition. And so really effectively managing these conditions and managing the resources around these conditions are really important.

So as I was saying before, diagnosing true catheter-associated UTI after SCI/D is extremely difficult. Because the high rates of catheter-associated UTI, or a true UTI, are high. You know, the folks are chronically catheterizing their bladder. There’s a lot of pathophysiology that makes them more susceptible to infection. There’s some really interesting research coming out about kind of like the chronic immune suppression after spinal cord injury because of someone’s inflammatory changes that hold on. So we know that the rate of this is high. We also know that the rate of the mortality and morbidity is high. Again the septicemia and the all cause mortality for people with spinal cord injury infections are still what’s killing people, unfortunately. But because of the reasons that we just mentioned, the chronic catheterization of the urine stasis, because of the neurogenic bladder, they also have high rates of asymptomatic bacteriuria. So if someone’s clinically okay and clinically doing well, if you take their urine there’s a good chance that it’s going to grow bacteria and so there’s a good chance that that’s going to lead to antibiotics. So making that distinction between true urinary tract infection that needs to be treated and asymptomatic bacteriuria is really important. It doesn’t help that the signs and symptoms of infection are challenging to interpret because people with spinal cord injury are insensate below the level of their injury. They may not have suprapubic pain. They may not have costovertebral tenderness. All of those kind of slam-dunk clinical signals that we usually use to treat a urinary tract infection are not necessarily going to be present in this population. They’ll have some more SCI-related type issues such as spasticity or autonomic dysreflexia which is kind of a change in blood pressure related to a noxious stimuli below the level of injury. But they’re very non-specific. That could be caused by any number of reasons and not necessarily an infection. And there’s been really great work by, again, my colleagues and mentors at the Hines VA kind of looking at the high rates of multidrug-resistant organisms even match for age and comorbidity in a non-SCI/D population. People with SCI/D have higher rates of really, really resistant organisms growing in their urine and then have high rates of antibiotic complications such as clostridioides difficile infection.

So hopefully I have not, I’ve impressed upon you why this is an issue but hopefully I haven’t caused you to kind of run away and stick your head in the sand and say, oh my gosh, how are we going to figure this out? With challenges comes opportunity. I’m a really big proponent of that and a really big believer in that. And so, one of the great things about taking care of people with spinal cord injury and disorders because, is the system that we work in within VHA. And so that gives us some really great opportunities kind of to make some meaningful change on this. So patient engagement is going to be really key. I realized that early on in my medical career if I have done my job correctly as a physiatrist, people with spinal cord injury are able to advocate for themselves and really kind of instruct and direct their care. Because unfortunately, most of the time that they interact with the health care system they are not interacting with a, someone who specializes in spinal cord injury. They are most likely interacting with somebody who doesn’t take care of many people with spinal cord injury at all. And so, if I’ve done my job correctly as their rehab doc, I’ve kind of taught them about their bladder and signs and symptoms of autonomic dysreflexia and signs and symptoms of urinary tract infection and so they are very much supposed to be an advocate and the voice for themselves, you know, if they’re able to. That being said, sometimes they have very fixed beliefs about when it comes to kind of urine testing and urine treatment and so any intervention that’s going to try to mitigate overtreatment needs involved patients. It’s not enough to involve the providers. It’s not enough to, you know, to involve the health care system. Patients have to be involved in the solution. And again, as I will describe on the next page, the VHA has their unique model of care for spinal cord injury disorders. They even have their own set of guidelines which kind of dictate some of the testing that we do and some of the routine testing that we do during kind of annual physical exams and so we’ll talk about the implication of that. So again, I hopefully have impressed upon you the importance of SCI/D specific interventions and then implementation of those interventions. There’s been great work done in the non-SCI/D population and that’s wonderful but I think it’s not going to directly translate to this population.

So quality of life is something that folks in physiatry and physiatrists really, really focus on. It’s kind of what we center our practice and kind of the, it’s just a different way of kind of thinking about taking care of patients and thinking and the interventions that we do. So the World Health Organization defines quality of life as an individual’s perception of their position in life and the context of the culture and value systems in which they live in relation to their goals, expectations, standards, and care. And so I really love that definition because it really puts the patient at the middle. I as their physician, I as their PCP as I’ll describe in a bit, have a laundry list of things that are important to me but if I’m not kind of reaching them and what’s important to them, it’s not really going to, it’s not going to be meaningful and it’s not going to drive the issue home. And so again that’s, health is just one part of that. Kind of how they interact with society or bladder infections or kind of bladder management controlling their life and keeping them from interacting with things that they want to do. How they access their environment, you know, getting around in a non-accessible world sometimes is tough. Trying to cleanly catheterize your bladder in a, you know, very small setting that’s not meant up to sit like that can provide some issues. And so, we want to understand all of that and kind of understand how that interacts with, you know, and how that, how those issues and kind of being able to access your environment go into this condition as well.

So again, we talked about the importance of patient engagement and one aspect of that, that we’re looking at is kind of medication adherence. Do people take the antibiotic that we prescribe them as we prescribe them? Or are they holding onto medications? Are they stopping short of the medications because of having complications and then that’s just not getting back to the provider? We want to understand all of that. And we also want to understand how patients with spinal cord injury and disorder like to receive information. Again going back to accessing a sometimes inaccessible world, the common ways that, you know, people in a non-SCI/D population access information and access clinical care can be very different in this population with the mobility issues and the transportation issues that come along. And so we really want to make whatever intervention that we have tailor to those needs.

So this is a map of the VHA SCI/D System of Care and the blue dots are the Spinal Cord Injury and Disorder Hubs. And so, Houston is one. The other ones in Texas are Dallas and San Antonio, and then there’s 25 across the country including Puerto Rico. And so, each hub then supports a smaller spoke clinic. Our spokes go as far east as Pensacola and we support those smaller clinics in kind of providing specialized care for their patients with spinal cord injury and disorder. And so we specifically say spinal cord injury and disorder. The injury comprising the traumatic more classic injuries that you’re usually, that you’re familiar with, with either falls or motor vehicle accidents being the top two etiologies by far but also disorder. We have a very high population of folks with cervical stenosis and other arthritic diseases and so can develop cervical myelopathy and spinal cord disfunction from that sort of way. Every center is a little bit different but, depending on the center, that may or may not include inflammatory myelopathy such as multiple sclerosis or transverse myelitis, again, this depends center by center. Amyotrophic lateral sclerosis may be included in those disorders. But it’s really kind of anything that is, you know, presents as a spinal ideology that we can take care of. And it’s one of the, well it’s the only system that I know of that employs physiatrists as primary care physicians. So as Dr. Trautman was saying in the introduction, I’m a physiatrist by training. I did my residency in Physical Medicine and Rehabilitation Medicine. I did a clinical fellowship in Spinal Cord Injury Medicine and then part of that fellowship training is really kind of learning the primary care aspect again. So I spent four years kind of becoming a specialist and then a sub-specialist and learning the preventative and kind of wellness medicine is part of what the fellowship training is about. And one of the reasons to do fellowship training in a VA System is to kind of regain those skills a bit. So it’s a unique model but they bet on us in the sense that we know a lot about people with spinal cord injury and that we would learn and kind of do some of the, have some guidance on the primary care and wellness issues. So that’s really kind of where VHA 1176 came from. And so basically that’s the directive, or the handbook, that kind of outlines the System of Care in Spinal Cord Injury. And so, it mandates that everyone with spinal cord injury disorder receive a yearly, something that’s called an annual examination. And it’s a history and physical visit on steroids essentially. And so, they meet with their physician provider, there’s a nurse involvement, especially for immunizations and other screening tests, and then they receive a battery of labs of which includes, right now, a urinalysis and a urine culture. And so these screening urinalysis and urine culture is very counterintuitive from some of the things that have happened already, that, some of the other national guidelines that are recommended. And so we’ll kind of talk about the implications of that so far.

And so that map kind of really brings up a good time to kind of talk to you about my network and my map and the links and connections of how I got to kind of where I am now. Because I think as important as the science of what we’re doing and, you know, the methods of what we’re doing, the thing that I love about health services research and then health services research in the VA, are the relationships and building that network and building that team of likeminded and interested people that all have the same goal of you which is in communicare of the Veterans that we take care of. So I did my residency at the University of Washington. Dr. Goldstein was actually one of my attendings, actually not at the VA, he worked at the, a county hospital there and so I knew he was interested in spinal cord injury. He knew I was interested in spinal cord injury, so we spent a lot of time talking about some of the issues that people with spinal cord injuries faced. Dr. Stephen Burns is the Care Line Executive there at Seattle. Again another one of my attendings, also knew that I was interested in research and I worked on some projects with him in residency. And so when I told them that I wanted to come back down to Houston for my clinical fellowship, they helped me get in touch with Dr. Holmes who is the Care Line Executive here in Houston who then put me in touch with some of the folks over at our Health Services Center or IQuESt. And so I met Dr. Naik when I was a medical student here. I, as Dr. Trautner eluded to, came down to Houston one weekend saying I’m looking for a research mentor. And so I talked with him and he was like you know I’m not really sure that I would be the best fit for your interest but let me put you in touch with Dr. Trautner. And so, put me in touch with her she did. And then the rest is history a little bit. And so through those networks, through those connections, I was able to make connections with Dr. Evans at the Hines VA, Katie Suda at the Hines VA. They’ve done a lot of work in spinal cord injury disorder and infections there. Through all of those networks, I’ve met different people across the country, as you can see here, and this is just representative it’s not everyone. And again, these mentors have not only been mentors, but they’ve been sponsors. And so, they have been very gracious in advocating for our work and advocating for the things that we’re doing all the way to, you know, the National SCI Director with Dr. Wickremasinghe and Erik Wallen who have been very helpful in kind of helping me talk and get in touch with the folks that I need to get in touch with to do this work. So I’ve been very thankful for that.

So this is some work from a paper that is in press. And so, looking at the challenges that people with spinal cord injury disorder face and how, again, the current interventions that are out now are not necessarily going to work. Because a lot of those interventions really kind of focus on surveilling is there a catheter, you know, being very mindful is there a catheter and then removing that catheter as soon as possible. But as we discuss, people with spinal cord injury have neurogenic bladder and so they’re going to have lifelong needs to instrument their bladder in many cases. And so removing the catheter is not necessarily going to be the most effective and appropriate thing to do. Again if someone’s not draining their bladder and managing their bladder appropriately that can lead to more infections from overdistention of the bladder, not only kidney failure, sepsis, and the downstream infections of that. So the right side of this diagram is really kind of just focusing on SCI-specific surveillance methods for catheter use. And so, yes, we want to look at their bladder function. We want to discuss, you know, hopefully with someone with an expertise in spinal cord injury medicine, a holistic review with the patient at the center, focus on, you know, best practices for catheter management and then really kind of honing in on that, distinguishing the asymptomatic bacteriuria versus true infection as we’ve talked about before.

So we know, even in this population that positive urine cultures drive antibiotic use. Again there’s been great work in the non-SCI population showing this. But, and at least on a small scale on our preliminary study just done retrospectively here at the Houston VA, we’ve been able to show that as well. And so over two years we had 327 kind of annual examination visits, that kind of primary care visit that I was telling you about before. Over three-quarters of those people actually had a urine culture obtained which is, again, in accordance with the current VA guidelines. Most of those positive cultures, most of those urine cultures were positive but the vast majority of them, using our classification system, recommended asymptomatic bacteriuria. So clinically insignificant infections, just a positive culture. But even still about, you know, over a third of those people who received antibiotics for urine unnecessarily. And again, we know, so the positive culture in of itself was driving the antibiotic use even if the patient didn’t have any symptoms and was feeling okay. On the flip side of that, none of the people with negative cultures received antibiotics and, again, that’s significant. So we know that the positive urine culture result is driving the antibiotic use irregardless of symptoms.

And again, this is looking at the predictors of antibiotic use and these are just the significant findings so age, some of the urinalysis results that we commonly get so like leukocyte esterase and nitrite and then UPO, which is a urease-positive organism, all drives culture use. And again, this is something that I realized from my clinical practice in that there’s definitely this notion that cultures with these organisms are more likely to promote stone formation so, oh we should really get rid of that bacteria so that person doesn’t develop stones. But there really hasn’t been any good evidence that’s shown that that is the case. That treating asymptomatic bacteriuria just with these organisms solely to prevent stone formation has any effect on clinical outcomes.

And so this is looking at kind of health care utilization 60 days after that annual evaluation encounter. Again as a provider, as somebody who takes care of spinal cord injury, I theorize and one of the things that we’re looking at with our current work is that we really feel like we’re doing good treating the asymptomatic bacteriuria. We really think that we’re helping this patient or preventing them from getting sick or preventing them from some sort of downstream complication. But unfortunately, again in this small pilot study that this doesn’t bear out. So the people that received antibiotics didn’t do any better in any clinical outcome that we looked at. So they didn’t have any fewer ER visits, any fewer hospitalizations. They still got more urine cultures connected. The people that got treated with antibiotics didn’t have fewer UTIs down the road or any other urologic complications. So we think that we’re doing good by giving people these antibiotics but it’s really not bearing out when we look at it.

So again we’ve talked about the scope of the problem and why it’s a problem and the confluence of issues that surround the problem. What can we do about it? And so this study was, we conducted, basically looking at the HAIs [sic] survey that was sent out to VA facilities back in 2012 just showing what resources are out there to take care of, to provide antibiotic stewardship in this population. And so, it was basically like a secondary analysis looking at, at that time the 23 facilities that had SCI/D centers versus the 107 facilities that didn’t and looking at kind of the differences in antibiotic stewardship [unintelligible 35:14].

And so, the take-home message of this slide is that, and I think intuitively VHAs that have spinal cord injury centers are well-equipped to, you know, have antibiotic stewardship initiatives in place. And so, they were more likely to have an infectious disease physician as part of the antibiotic stewardship team. They were more likely to have specialized pharmacists that had ID training and they were more likely to have ID fellowship program. And so, these three inodes were actually identified on another article by Cho [sic] and colleagues to significantly impact antibiotic use. And so, having these items in place as part of a stewardship program actually reduce antibiotic use, which is what we want. So yes, the scope of the problem is big, it’s complicated, but SCI/D centers, I think from the nature of being in the bigger more tertiary VHA hospitals are well equipped to put interventions in place to deal with this.

So that’s what we know. But when we started off on the journey for my CDA we wanted to know what else do we need to provide effective antibiotic and test stewardship in this population. And again, I just want to go back to really needing to understand what patients believe, want, and expect in regards to getting their urine tested because, again, I don’t think any intervention is going to be successful for this without involving patients. We need to understand what the providers’ concerns and rationale are between giving these testings. And that’s where that network came in very handy, talking to folks like Dr. Goldstein and Dr. Burns about how these things came to be historically and having questions and needing to know more was really important. And then, again, we need to understand kind of what’s the outcomes and the consequences of what we’re doing now on a national scale to inform whatever intervention we’d like to do.

And so that’s really kind of the basis for my CDA which is entitled Optimizing Bacteriuria Management in Veterans with Spinal Cord Injury/Disorder. And so we really are going to go through from a nuts, you know, a nuts and bolts approach really trying to understand why we’re doing the things that we’re doing. What providers’ concerns are, what patients’ concerns are, and then either proving or disproving those concerns using kind of, big data. And so we’ll kind of run through some of that here in a second.

So this is results from a provider mixed-method study that we just wrapped up and hopefully are going to be submitting this for publication soon. So what we did is that we talked to SCI/D providers nationally, either through a web-based survey which we administered on REDCap and it was the Kicking CAUTI Survey, the same survey that Dr. Trautner has used in a lot of her studies in the non-SCI population kind of looking at knowledge and behavioral, cognitive-behavioral domains around urine testing and treatment. So we administered that survey out and then we also talked to several SCI providers using qualitative interviews. And so, the interview guide was based on our domain of the, again, going back to that kind of CABANA framework of why people don’t follow guidelines. Is it a knowledge issue, is it an attitude behavior, is it an attitude issue, do they not, do they have a negative attitude or a positive attitude towards clinical practice guidelines, and then how does that influence their behavior? And so this slide is looking at kind of, is looking at the testing. And so, the question on the survey was that, I usually order a urine culture on catheterized patients when there is a change in urine color, cloudiness, or odor? And again, these are non-national guideline indication reasons for checking a urine culture. Again there’s lots of things that can change your urine color. There’s lot of things that can make your urine cloudy. Your urine can smell for lots of different reasons, believe it or not, and so these are not necessarily indicatives of infection. But again, at least 30% still endorsed that as a reasonable reason to check a urine culture on someone. And these are just a representative quote on that. And again most people say that I feel confident that I know when to order a urine culture. And so they feel confident about the guidelines and what’s supposed to happen. Most people feel that way but as we’ll see later on they endorse not really knowing a whole lot about the guidelines and then not feeling like their applicable to their patients.

So when it comes to treatment, the question on the survey was asymptomatic bacteriuria requires treatment more often in geriatric patients than younger patients? And again, most guidelines do not endorse this as a decision point for treating. But again, the vast majority, or the majority of people still consider age and whether or not to treat somebody with asymptomatic bacteriuria which is guideline discordant. And again, the whole idea of gram-negative organisms which include those [unintelligible 41:02] producing organisms like Proteus species which, I was saying before, a lot of people that treat people with spinal cord injury are really worried about those organisms and their propensity to cause bladder stones. That definite, and again 41% of those folks still think that that’s a reasonable reason to treat asymptomatic bacteriuria which also guideline discordant.

So when it comes to the guidelines themselves we really wanted to understand again their attitude towards them. Do people that treat, do SCI/D providers feel positively towards guidelines in general? And so, the overwhelmingly yes. You know, people with spinal cord injury disorder want good guidelines to treat their patients but they’re also concerned that there’s just not a whole lot of SCI specific data supporting those guidelines. Again there’s not a one-size-fit-all intervention for this population and it really just kinds of needs to be tailored and that’s their concern.

So we did a, not completely parallel but a similar mixed-method studies with patients that we are finishing up recruitment for right now. And this has been one of the joys of my year. Actually, just calling and talking to people with spinal cord injury disorder all across the country because I am amazed at their enthusiasm at talking to me about, you know, sometimes some very private and kind of, you know, intimate things. You know, when it comes to managing your bladder and what you do and how you’ve had infections and kind of how that makes you feel. And so that’s been a joy of my year and the joy of kind of doing VA research. And so we’re also doing interviews with them. There’s are a little bit different. It’s more about, there’s some medication adherence parts, questions, you know, do you take your antibiotics as you’re prescribed? Do you hoard your antibiotics? You know, do you take antibiotics that you get from someone else? Kind of get at, trying to get at some of those attitudes and behaviors. And then we, as far as for the quantitative data, we give them the Morisky Medication Adherence Scale, which is a widely validated and widely used scale for medication adherence to antibiotics. And this is really neat because we actually got a, if you’re familiar with the MMAS scale its drug-specific. And so, we actually work with Dr. Morisky and his folks at UCLA to get the scale tailored for antibiotics for urinary tract infection. So that was really neat. And so, again, we’re just now kind of closing up recruitment on that and learned a lot of, you know, interesting challenges in recruitment for that and so we’re going to start analyzing that data soon.

We are also then moving into more of the big data portion of the project that we were working on. So again, basically just trying to reproduce the study that we did at the single clinic here in Houston. Kind of looking at, you know, the outcome of antibiotic use within seven days of annual evaluation encounter and then looking at the outcomes on a national scale, using the Corporate Data Warehouse data, and then also the newly developed SCI/D Registry Report from VSSC. And so we’re kind of merging those two data sources to gather all the information that we need. And so far we’ve come up with over 7,000 unique SCI/D annual evaluation encounters in fiscal year ’18 and ’19. And again, we’re going to look at, are we really moving the needle? Are we affecting the outcomes that we’re concerned about when providers treat asymptomatic bacteriuria? Are we really making a difference in the things that we care about? You know, so subsequent urine tests, any subsequent infections, ER visits, hospitalizations, and some of the downstream effects of antibiotic use.

So once we finish all that, the idea, the culmination of my CDA project is to develop the Test Smart, Treat Smart intervention which are going to have patient and provider components with a goal of just really helping everyone make smarter evidence-based decisions in real-time at the bedside about, am I going to test this person’s urine? What is my, you know, suspicion for urinary tract infection? Have I considered other things? And you know, providers and patients being able to talk with each other and feel good about the decision that they make together. So that’s the whole idea. And so, once we develop the intervention, we’re going to do a feasibility trial, at least here in Houston, to kind of work out the kinks. You know, see what works, see what doesn’t with the idea of then hopefully trying to spread the intervention to other centers.

So my overall research goals and research plans are, the biggest thing that has come out of, at least talking with providers, is that, again, it’s hard to distinguish catheter-associated UTI from asymptomatic bacteriuria. If they could really use some guidance and use some help and so if that comes in the form of a diagnostic tool, that would be excellent. And there’s a lot of great research and things ongoing about looking for different biomarkers for distinguishing urinary tract infection to clinically meaningful urinary tract infection that could become a problem from just, you know, the bacterial colonization of bladder that so many of these patients have. And then just gathering more specific evidence with the goals of minimizing catheter-related harm. There’s other bad reasons, there’s other bad outcomes of using a catheter that are beyond infection and a lot of times we don’t really think about those things and look at those things. I don’t think we have fully yet. Again we want to reduce antibiotic resistance. And then really kind of going back to that whole idea of quality of life. Because after all of this, after all the science, after all the data, there’s a person on the other side of that that this is affecting, that these infections, or lack thereof, is disruptive to, that this, you know, the complications that come along with antibiotic use is really kind of disruptive to their life. And it’s really why I’m passionate about kind of trying to answer these questions and be thoughtful about what we’re doing so that my patients don’t have to be bothered with this as much. It’s you know, there’s lot of living, there’s lot of other things that they need to get back to doing. And so, dealing with, you know, unnecessary antibiotic use and the consequences that come with that I just want that to be one less thing.

So I have a lot of people to thank. So the Career Development Award mentors and advisors. You’ll see that list there. I’m really thankful, I worked with Anne Robinson, kind of developing my Career Development proposal. She has tetraplegia and is the President of the Texas Paralyzed Veterans of America Society which is a huge patient advocacy group that influences a lot of what we do in the VA in regards to SCI/D care. And so I was very thankful for her reading over my application and kind of writing a letter of support for it. And also giving us a way to kind of talk to patients and access to patients that way. And then, again, this is a not all-inclusive list but just people that I have worked with along the way. Again that I’ve collaborated with, that have been mentors, that have been sponsors, and that I’m extremely thankful for.

So that’s it. Again I can be reached at my email address and if you tweet, you can tweet me @fskeltonMD, so. And thank you for your time.

**Rob:** Thank you, Dr. Skelton-Dudley. We do have a couple questions queued up. But before I launch in, let me let the rest of the audience know that if you have a question, you can enter it into the question section in that GoToWebinar dashboard on the right-hand side of your screen. You can click in the triangle-shaped icon and it will open up. You can even pull it out, make it bigger. As for the first question, for chronic indwelling urinary catheters what is the recommendation about routinely changing them on some type of schedule?

**Dr. Felicia Skelton-Dudley:** Sure. And Dr. Trautner, I feel like we looked at this very recently because it came up not infrequently. We as a clinical policy, do indwelling so that’s including the Foley and the suprapubic catheters about once a month. There’s not a lot of great data to support that one way or another. It’s just a convention, it’s just a standard. But we’re usually changing out catheters once a month sterilely depending on, you know, if the person has some sort of urethral stricture or false passage, we have our urology colleagues help us. But if not, you know, the spinal cord injury nurse is usually doing it in the clinic or for our home-based primary care patients, they’re doing it at home. But monthly is what we do, at least to my knowledge. There’s not a lot of great data kind of driving that, it’s just what we do clinically.

**Dr. Barbara Trautner:** Yeah, this is Barbara Trautner. There is not an evidence-base to suggest a specific catheter change frequency. And probably the reason that there isn’t, is it is something that needs some individualization. Because some people are colonized with stone forming organisms so they will block off their catheters at a fairly rapid rate, like even once a week. Whereas other people don’t, and they might have patent flow through their catheter for three months. So I think one month as been adopted as a general standard but that needs to be individualized by the specific patient needs. Any other questions on that?

**Rob:** There’s one that’s related which is, what is the guidance for going from an indwelling catheter to a suprapubic?

**Dr. Felicia Skelton-Dudley:** Sure. And that’s mostly a clinical decision. It’s one of those things where I was talking about in the kind of SCI specific interventions. Bladder management really needs to be a discussion and shared decision making between the patient and physician hopefully with some knowledge and some background on treating neurogenic bladder because it’s not a one-size-fits-all discussion. We usually consider going from an indwelling Foley to a suprapubic catheter, to take the catheter out of the urethra, for whatever reason, you might want to do that. And so, you know, long-term you run the risk of traumatic hypospadias and having traumatic issues and kind of destruction of the urethra and of the penis because of that. If you want to do other things with your penis such as sexual activity and that sort of thing, having a suprapubic catheter is really advantageous for that over having an indwelling catheter in the urethra. Again there’s actually been a really good Cochrane [sic] review that comes out that shows that there really isn’t a different in infection rate so that’s not a reason to give someone a suprapubic catheter but, it’s a discussion. You know, if you’re going to have a long-term catheter for a long time and, again, you want to try to minimize some of those catheter-related harms that we were eluding to, a suprapubic catheter may be the best way to go. But there’s some other, it’s another surgery, it’s a hole in your bladder. Some patients don’t want to have any more surgery because they’ve already had a lot more surgeries and, you know, cosmetically it’s a hole in your abdomen. And so those are all things to kind of consider and discuss. But that’s why it really should be on an individual basis and shared decision making with the patient. You know, we don’t just dictate to our patients, oh you should absolutely have this one catheter type, or you should manage your bladder this way. It really is a discussion.

**Rob:** Thank you. The questionnaire actually followed up while you were answering that one. The question from the, to the first question. And says, so the changing of catheters is based on obstruction and not to try to prevent colonization?

**Dr. Felicia Skelton-Dudley:** Yes. It’s based on the.

**Dr. Barbara Trautner:** That is correct.

**Dr. Felicia Skelton-Dudley:** Yeah.

**Dr. Barbara Trautner:** That is correct. They will become colonized no matter what.

**Dr. Felicia Skelton-Dudley:** Yeah, yeah. It’s literally just trying to prevent, to keep a functioning catheter in that person’s bladder and so that means, again, we flush that somebody is prone to obstructing the catheter, we recommend flushing. Again there’s not a whole lot of evidence, there’s not a lot of science kind of driving flushing it how often, with what, and so we’ll use any number of solutions. But then it’s all about keeping a patent catheter. We don’t fool ourselves in thinking that, you know, we’re trying to prevent long-term infections with this. It’s really just trying to keep a patent open catheter because we know an obstructed catheter will lead to bladder distention which will lead to more infections. We do know that. And so, it’s really just trying to keep that catheter functioning.

**Rob:** Thank you. This is the final question that we have queued up at this time. We all worry about our patient ending up in ICU with sepsis. How many SCI patients have this occur each year?

**Dr. Felicia Skelton-Dudley:** So that, I think going back to that slide where we looked at the HCUP data. I think it was like 17%, or almost 18% came in with septicemia. And again, I don’t have a way of distinguishing, of parsing out, you know, how much of that was urosepsis, how much of that was sepsis from pneumonia, or sepsis for other causes. But again, given the high rates of genital urinary complications in that population I would have to think that a good chunk of those folks that present and are admitted with septicemia are septic from a urinary source.

**Rob:** Thank you. That was the final question we had queued up. I wonder if Dr. Trautman has comments that she’d like to make before I give you the final word, Dr. Skelton.

**Dr. Barbara Trautman:** You know, I think our audience might be interested in what you think will be the biggest challenge to improving testing for and treating, you know, for urinary issues in persons with spinal cord injury. What do you think will be the biggest challenge to improving practice in this area?

**Dr. Felica Skelton-Dudley:** I think making that distinction between the asymptomatic bacteriuria and a true infection that’s clinically meaningful, trying to come up with a better definition of clinically meaningful UTI, I think is the next challenge, is the next thing to tackle in this population because it’s vitally important. Because like the person that comments well we all want to take care of our patients. We all, none of us, unfortunately if you take care of people with spinal cord injury, you’re going to see that person that comes in septic, you know, and has urosepsis and is in the ICU and again, maybe, you know, parishes from that. And so that’s the ultimate outcome. That’s always in the back of our mind while we’re making this “easy diagnosis” of urinary tract infection. And so, I think really giving providers some tools in their toolkit to make that decision more effectively and to feel confident about that decision, I think is the next big challenge, the next big hurdle.

**Dr. Barbara Trautman:** Sounds good. Sounds like an empowering, as well as, informing intervention is needed.

**Dr. Felicia Skelton-Dudley:** Mm-hmm.

**Rob:** While you were making that comment one of the previous questionnaires wrote in, huge challenge. PT comes in septic, I’m not sure what PT exactly means, but how does one know if it is the urinary source? Patient. Patient comes in septic.

**Dr. Felicia Skelton-Dudley:** Patient, mm-hmm.

**Dr. Barbara Trautman:** Well I’m happy to start on that one.

**Dr. Felicia Skelton-Dudley:** And so, I think. Sure.

**Dr. Barbara Trautman:** Or if, it’s Felicia’s talk. Let Felicia talk.

**Dr. Felicia Skelton-Dudley:** So yes, is the short story. Is, again there’s and I think one of the nice things about the interventions that have already been developed is that you go through and, you know, you want to look at, you want to start globally and make sure that you’re looking at all the other reasons why that person could be sick and why that person could be septic instead of kind of automatically defaulting to the urine. I think that’s really, really important. Because I think because the urine is easy to get and we know that it’s a common culprit in people with spinal cord injury, that we don’t look at their lungs as closely as we could. You know, people have pressure injuries but, depending on when that person that, you know, how bad they are, how deep they are, is that, you know, is that more of the reason? The cause of their infection? You know. The pneumonia piece is probably the biggest thing that we probably overlook because we’re so quick to jump to the urine. And so just really kind of going through things systematically and kind of looking at everything systematically I think is going to be really important.

**Dr. Barbara Trautman:** And if I could comment. We’re not talking about withholding antibiotics ever from someone who’s presenting with sepsis. You would treat broadly and empirically in that situation assuming it could be from multiple different sources and try to cover based on prior cultures to what, you know, you might expect in terms of organisms. What we are talking about is the fact that treating asymptomatic bacteriuria in the bladders of people with spinal cord injury will not prevent that eventual sepsis. It just doesn’t. The bacteria comes back. So all we do is by repeatedly treating it when they’re asymptomatic is set them up for having a resistant organism that ultimately may cause sepsis.

**Rob:** Thank you, doctors. It’s now the top of the hour. So since we have no more pending questions I’ll go ahead and close the webinar. Audience members, when I do so, you’ll be presented with a few questions regarding the quality of this seminar and the technical aspects. If you would just spend a few moments to go ahead and provide your answers to that. We do count on your answers to continue to bring you high-quality Cyberseminars such as this one. So Dr. Skelton-Dudley and Dr. Wells [sic], thank you very much. Do you have any closing comments that you’d like to make Felicia?

**Dr. Felicia Skelton-Dudley:** No, again, just thank you for everybody’s time and attention and please feel free to reach out to me about questions. I’d love to continue the conversation after this talk.

**Rob:** Great. Thank you. And her email address is felica.skelton2@va.gov and Twitter is @fskeltonMD.

**Dr. Felicia Skelton-Dudley:** MD.

**Rob:** Thank you once again.

**Dr. Felicia Skelton-Dudley:** All right. Thank you.

[ END OF AUDIO ]