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Session: Development of a Bundled Post-Stroke Hypertension Improvement Intervention

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Molly: I’d like to introduce Dr. Jason Sico. He’s a health services researcher at the VA Connecticut Healthcare System. He’s also an assistant professor of neurology and internal medicine at Yale University School of Medicine. Joining him today is one of his mentors, Dr. Dawn Bravata. She is a research scientist at the **William M. Tierney** Center for Health Services Research at the Regenstriefe Institute. She’s also a core investigator at the VA HSR&D Center for Health Information and Communication and co-principle investigator for the HSR&D **PRIS-M QUERI** and a professor of clinical medicine and neurology at the Indiana University School of Medicine. So she will be joining us for comments and be available for Q&A at the end of the presentation. So without further ado, I would like to turn it over to you now, Jason.

Dr. Jason Sico: Thanks. Fantastic. Excellent. Thank you for that introduction. I really appreciate that. So as mentioned, my name is Jason Sico. And I’m currently on the third of a four year Implementation Science Career Development awardee. And I really appreciate the chance to be able to talk with everyone about what I’ve been doing over the last couple of years. And sort of how I’ve been able to wed both my clinical interests as well as my interests in developing organizational development to help with post-stroke hypertension management. So I thought we would have a bit of an outline for our discussion. So I want to start off by talking about what we know about hypertension management, especially for Veterans with an ischemic stroke event, but then also briefly overview my interests as well as my clinical training and my personal interest in it. And then you’ve got that polling business question about a bundled complex post-stroke hypertension improvement intervention and looking at the barriers, including a watershed effect. And for any other neurologist and healthcare providers will recognize that watershed is a type of stroke.

So, just so we can all get to know each other a little bit more, poll question number one: what hats do you wear for VHA?

Molly: Thank you. So for our attendees, as you can see, the poll is open now. So we know that you may wear many different hats within your roll at VA. But we’d like to get an idea of what your primary roll is. So please select one of the following: researcher, administrator, healthcare provider, educator, or Yankees fan. I have to whisper that one. Looks like we’re about, three quarters of our audience have already voted. So we’ll give people just a few, a little bit more time. Okay. I’ll go ahead and close this out and share those results. So it looks like we’ve got a split: 57% of our respondents said researches, 36% healthcare providers, and 7% educators. So thank you to those respondents. And I’ll turn it back to you now.

Dr. Jason Sico: Okay. So one of the things that we know about the ischemic stroke is that someone’s care needs are different depending on when they present. And the sooner that they present also makes it makes it more likely that they’re going to get different types of therapy. But I think it’s important to recognize that there is too the spectrum of ischemic stroke care. Because not only do patient needs differ, but then the types of providers delivering that care can differ also.

So hopefully people present to the emergency room in a timely fashion, and then they are eligible for clot-busting medication as well as aggressive medical management. And then oftentimes people get hospitalized and admitted to an ICU [stroke unit floor? 3:51]. And this is where we start paying attention to a lot of the stroke performance measures which are known to improve outcome.

But then what happens when people ultimately leave the hospital? If they go back into the community, if they go to rehabilitation, if they go to short term rehabilitation or extended care facilities, how are these care transitions managed? And management is oftentimes a variability in terms of where patients will go after they get discharged. But then also their care becomes sort of parceled out among different providers, delivering either specialty or primary care. So by the time someone gets to the outpatient clinic, some of the things that we’re thinking about are risk factor management, what are rehabilitation needs? What are the family support and other services that someone may need?

And a lot of the reasons I’m really quite interested in terms of these care transitions, as well as how well we do outpatient care. A shared mentor of both mine and Dawn Bravata’s is the late Barry Browse. So he was a health services and stroke researcher. And he also, world famous stroke epidemiologist. And I remember having the chance to get to know him. He was a life-time non-smoker and died at the age of 49 from complications of lung cancer. And he mentioned that, considering the spectrum of ischemic stroke care, for example, it’s really important to try to deliver tPA, clot-busting medication, as quickly and calmly as possible. But if you don’t think about the spectrum of someone’s care, then everything that you do, all the upfront things that we do in the emergency room and the hospital, may be all for naught. So the idea is that we really need to pay attention to helping people effectively manage the risk factors to prevent them from having that second stroke.

So some of the things that we know in the, just general considerations for stroke. So about every four minutes, someone dies from a stroke. But every 40 seconds, someone in the U.S. has a stroke. And the majority of these patients survive. And therefore, that means that they’re susceptible to future, more serious vascular events. So here we see that stoke as well as [unclear 6:10] is quite prevalent in the general U.S. population. But it is also prevalent in the VA, as well. And a number of them sharing in terms of about 6,000 Veterans with stroke present annually to a VA emergency department or hospital ward. Those are just the Veterans that have had a stroke that present to a VHA facility. A much larger percentage, we believe, actually present to community hospitals just because of the stroke systems of care that have been placed to get people and patients to the nearest facility that could offer comprehensive stroke services.

With that said, a majority of these patients, regardless if they present to a VA-based center or if they present to their community center for acute stroke services, so we’re getting their primary longitudinal specialty outpatient care in VHA somewhere. So in considering hypertension is an extremely important risk factor, we know that about a third of the adult U.S. population has hypertension. It looks like it’s a little bit higher in the general Veteran population. And it’s much higher among Veterans that have had an ischemic stroke. And we recognize the importance of effectively treating stroke, even just in terms of blood pressure reduction, reducing the chances of future ischemic stroke. And it’s thought that of all the risk factors, hypertension unto itself, specifically uncontrolled, accounts for about half of all ischemic strokes.

So I always get excited around my birthday. And about every three years the American Heart Association/American Stroke Association, we usually delivery some goody right around the time of my birthday. And typically it’s in the form of the updated stroke prevention guidelines for stroke and transient ischemic attack. And just to highlight some of the work here, so Dawn was on the section that wrote several of these prevention guidelines. And it really uses some stronger language in terms of how we should sort of treat these patients and when we should start thinking about treating them. But really sort of stress the importance that treating hypertension is probably the important thing that we could do for these patients. But then also we know that hypertension remains undertreated. So worldwide, only half of people have their blood pressure controlled. So what that means when you create that for the stroke population is that we really need programs that can implement and effectively improve blood pressure management. And not just these programs, but also effective implementation strategies.

So I had the added sort of bonus in 2014 on my birthday, where the American Heart Association/American Stroke Association, to include specific implementation recommendations regarding risk factor management. And specifically, they thought that when possible monitoring this treatment of the national evidence-based guidelines on population base on a whole is really important. And we know that using VHA administrative data, we’re able to sort of monitor achievement of past rates and performance on metric such as blood pressure control. We learn also that how some of these programs [unclear 9:26] start thinking about implementing programs to improve adherence to risk factor management guidelines, especially hypertension.

And one of the things that when I think about voluntary hospital based programs, one of the things that may come through for this talk, is that maybe it’s less hospital-based but more healthcare system or organizational-based. But also when I was reading this, I was hearing some echoes, or reminded me of something that the IOM teaches us [unclear 9:58] quality CHASM is that oftentimes we have to think about redesigning healthcare and specific coordination of care across patient/physician is really important. And that things don’t just stop when someone gets discharged but this idea that there should be continuous quality improvement, but also accountability when we may not be doing the best we can as a healthcare system.

So with that said, I became increasingly more interested in, okay, well, so what’s out there? What do we know in terms of how well post-stroke blood pressure interventions that have developed? And how well do they work? And this [unclear 10:36] review talks about, there’s an overview of 26 randomized control trials that compare these [unclear 10:42] interventions but modifiable risk factor. The majority of them are addressing hypertension. And they sort of classified these, are they organizational, educational, behavioral for patients. Are they educational/behavioral for providers? And then looking at how well these different types of interventions improve blood pressure control, the educational/behavioral dimensions for patients and providers didn’t work all that well. Organization ones worked okay, but still not great. So we’re just talking a couple millimeters of reduction in blood pressure.

It was about 15 of these studies were started at the time of hospital discharge. Interesting with all of these studies, they sort of implemented it and had it run its course and didn’t have any sort of follow-up. So none of these interventions really looked at itself and said okay, “well, we’re starting at time zero and maybe at three months, four months, six months we’ll look to see what’s working and what’s not working”. And then a lot of these interventions in pre-risk factor management were developed in other types of patient populations. And said, “okay, well, works well in the stroke population. What works well in the post-[unclear 11:52] population. Lets see how well it works to improve risk factors in ischemic stroke patients.”

So it seems like maybe organizational intervention may work a little bit better, but that there’s definitely a need for things that could help improve blood pressure management. So with that as a bit of a backdrop, really became increasingly more interested in how the VA’s doing, treat blood pressure for Veterans after they’ve had a cerebrovascular event. So I’ve seen some numbers in terms of how well blood pressure control is for the general Veteran population. And the numbers I’ve seen, upwards of 90% of Veterans have their blood pressure thought to be well controlled. So do we see sort of a similar level of control among people that have had a cerebrovascular event.

So another poll question: what percentage of Veterans, do you typically think, after they’ve had some kind of cerebrovascular event can obtain goal blood pressure by six months? And while you guys are writing, one of the reasons why it’s oftentimes thought of about six months [unclear 13:06] is that we know within the first six months after someone gets discharged from a stroke, it’s an especially vulnerable period of time for them. And then it also looks like if blood pressure control doesn’t happen by six months, then it’s not going to happen, sort of in a longer period of time. So recognizing that the longer someone’s blood pressure remains uncontrolled, that increases the amount of time that they’re at risk for [unclear 13:30].

Molly: Okay. Thank you. So we do have the poll question open. And the responses are coming in. Jason, I did get a couple requests that maybe you could talk a little closer to the phone and a little slower. I think people are having a hard time. You’ve got so much information to give and so little time. Alright. It looks like we’ve had about two thirds of our audience. So I’ll close that poll out and share those results.

Dr. Jason Sico: Absolutely.

Molly: So 47% of our respondents replied less than 25%; 41% of our respondents said 33%; 12% of our respondents said 67%. And nobody answered anything higher than 67%. So thank you to those respondents. And I will turn it back to you now.

Dr. Jason Sico: Okay. Great. Excellent. So some work that has been done in the VA has been examining blood pressure control. And at the time using the AHA/ASA definition of goal blood pressure being less than 40/90 at the six-month mark. So we’ll go through this study a little bit. But it looks like stroke patients at six months after they’ve been, they’ve remained uncontrolled. So 67% seem to have good blood pressure control. Again, that’s better than half of people in the world that don’t have controlled blood pressure. But it’s still nowhere near as good as the general Veteran population.

So some of the things that Christian and others in the paper had talked about was who was getting the types of therapy that we know are recommended. So it looks like less than half of people that had their last documented blood pressure was greater than 140/90. And we’ll discuss reason as to why post-discharge blood pressure is exceedingly important. Only 15% of patients received the [unclear 15:39] diuretic at the time of discharge. And in thinking about how their blood pressure was six months later, we see increases in systolic blood pressure in over 140 millimeters of mercury. Yeah, the blood pressure control was within a six month decrease.

So the idea is that there’s definitely room for improvement for blood pressure control. And I guess some other things too is that people that leave with uncontrolled blood pressure are likely to continue to have uncontrolled blood pressure. So the idea being that perhaps systematic in hospital initiation and secondary intervention may be important in that it’s probably worthwhile, especially among patients that have higher blood pressure at the time of discharge. And then intervention, specifically they want to target those that really don’t have controlled blood pressure.

So in a follow-up companion paper, looking at 12 months rather than six months, it looked as if 38% of people had an elevated blood pressure and were eligible for treatment intensification. So what that means is that they were seen by a provider. Their blood pressure was elevated. And there was an opportunity to improve blood pressure control by increasing the dose of the medication. So thinking about what these patients were like at the time of discharge, about half were discharged with an elevated blood pressure above goal. And these patients had a little over two opportunities for treatment intensification. And treatment intensification did not occur at every visit.

Among patients that had had a higher blood pressure, so systolically [unclear 17:26] 60, they also had a little bit more than two intensification opportunities and had their medication intensified a little bit more often, but still definitely room for improvement. And this was what the trajectories of some of the blood pressure looked like, depending on if they were discharged with systolic over in the 160, 140 to 160, less than 140. So the green line sort of recognizes that these are the people that had discharged blood pressures less than 140. So those were at goal and tended to stay at goal. Those with the higher blood pressure, so at the blue line, shows that blood pressure sort of improves at some point in time but then continues to be elevated. And then sort of a similar but less [unclear 18:12] phenomenon occurs among those with blood pressures of 141 to 160.

So some of things that this paper taught us was that a lot of patients are discharged with an elevated blood pressure and then continue to have consistently elevated blood pressure throughout the year after being discharged. And then, again, maybe we should start thinking about implementing risk factor modification in the in-patient setting for these stroke patients. And one of the nice side bars that they mentioned was that initiation of blood pressure medication and other secondary preventive strategies is standard of care for in the post-MI population. And implementation in starting things like [unclear 18:57] and standard of care for stroke patients, but blood pressure less so.

So why me, and why am I interested in this topic? So as it was mentioned at the top of the hour, I decided to do a combined neurology/internal medicine residency. So typically people don’t subject themselves to a couple extra years of clinical training and being on call unless they have a purpose in mind. And I really became increasingly interested, especially during medical school, about how specialists and primary care providers interacted, and how they co-managed to varying degrees the same person, but maybe looking at them through different lenses, if you will.

So this is a picture of my mom’s dad, my grandpa. And he served in Korea. He was in the Army. And he helped raise me and my three younger brothers. So we grew up in northeastern Pennsylvania. So for those of us that watch The Office, parts of it were filmed there and the plot was set there. So most people know it for that. But now everyone on the call will know who took this picture of my grandfather’s basement. So this is my grandpa after he’s had his second stroke. And I distinctly remember being a third-year medical student a few years after TPA was FDA approved with the treatment of acute stroke. And my grandmother called me up. So imagine the days before cellphones. So called me up on my landline before I was going to class and told me that my grandpa had acute right-sided weakness and wasn’t able to speak. So he was actually one of the first people in oneof the hospitals in my hometown to get TPA. And I would subsequently go with him to follow-up appointments at the local VA. And I just couldn’t understand why people weren’t addressing his blood pressure and managing some other of his risk factors. And one of the things that really stuck out was that different provider texts thought that different, alternative providers should be the ones being the captain of the ship.

So you fast forward about 10 years in total, actually a little bit less. And I’m a resident at the New Haven Hospital in the VA, West Haven. [unclear 21:25]. So this is our stroke clinic. So people may recognize on the far right of that picture of Dr. Dawn Bravata and to her left, Larry [unclear 21:37], and to our left, his right, is an older picture of Bob Kearns. And Dawn and Larry put together a multidisciplinary clinic to really look at the same patient and maybe from different perspectives, but bring together provider types to really effectively co-manage patients. And I really enjoyed that model of care, but also really enjoyed the fact that people, that a clinic was sort of holistic in their approach to post-stroke care. But also recognizing that such a model may not be feasible everywhere, but if a specific clinic may not be able to do something like that, how could a local healthcare system do that?

So I would go on to finish my residency and do a research fellowship here at VA West Haven. And increasingly became more interested in health services research, but also drawing on my expertise in terms of primary care and specialty care, but how these different provider types interacted. And I think some of that informed our approach to developing the intervention that we’ll talk about next. So some of the other lures of being at the VA that I’ve come to really love is the fact that we have access to a whole lot of data. And we have access to people that could help us generate more data.

So if we want to take to the 30,000 foot view, using administrative data. Or if we want to get down in the trenches of maybe here [unclear 23:16] data, or even going into the trenches and talking to providers and administrators, quality improvement personnel and getting a sense of, well what’s it like to deliver care? What works well? What doesn’t work well? What can we learn from you? And then what types of interventions do we think that we could implement? And we could do all that within the VA, which I really think is fantastic. So what we’ve done during the last couple years this VA is go through these different strata to get a sense of how can we really develop a well-informed intervention that hopefully could work to improve risk factor management, especially stroke care.

One of the things that we did earlier on was that we wanted to see how facilities were dealing in terms of blood pressure control. So this is, again, using the AHA/ASA guideline of less than 140/90, how individual medical centers were performing. So we also took this hierarchical linear modeling approach to address the fact that there’s clustering of patients within facilities. And this, we felt, would be one way to enhance the precision and reliability of performance estimates across VA medical centers.

So on the X-axis we see an ordering of individual VA medical centers. And on the Y we see the individual pass rates. So I’ll draw your attention to the blue line. So oftentimes seeing as we’re using 80% cutoff defining the quality care for a given metric. And pretty much none of the VA medical centers routinely get to that mark. So here we see that there’s a lot of variability in terms of post-stroke blood pressure management.

One of the other things we use this information for was to say, “okay, well, who are the better performers? Who are the worse performers?” And we could use this as a rough guide to go to different sites and say, “hey, we’d like to come, we’d like to learn from you. Would you invite us in to come and conduct site visits?” One of the things with this analysis is that we restricted it to VA medical centers that saw at least 20 patients per year. One of the reasons why we did that, because we wanted to have a sense of well, maybe one of the worst performing sites could later become an intervention site.   
  
So then what we did was that we used a combination of administrative data and chart review data and something called the Office of Quality Performance Stroke Special Project. And what that was a sample of 5,000 medical records that had some small volume centers, larger volume centers. But then there was a subsample where we were able to do chart review in terms of what the care utilization of someone that was admitted to a VA medical center before stroke and after the stroke. So not only the past medical history, but also active medical problems, stroke symptoms, stroke severity, as well as what providers were thinking about and documenting in terms of plan of care. And then what we did is we merge this with some VA data as well as [unclear 26:38]. And that also includes patient-level administrative data and health care utilization.

Here’s the comparison that I did between patients that had achieved [unclear 26:52] blood control and had sub-optimal control. And I think one of the things that struck out to me was that patients that had sub-optimal blood pressure control, you know some of the providers that were really thinking about, “hey, we need to address their blood pressure” and documenting sort of a plan of care at the time of discharge. So the idea that someone had someone had suboptimal blood pressure control, they’re more likely to have a plan of care that was documented.

So at looking at other predictors of achieving goal blood pressure, so unfortunately people, if they had a prior stroke, they’re more likely to be at goal for blood pressure. And then if they had good blood pressure coming in the door, they’re more likely to have good blood pressure six months later. But then also there are a couple cardiac conditions that look like those people had that are blood pressure controlled, including, [unclear 27:50] heart disease, and congestive heart failure. How much of that may be a process, a function of the individual conditions of the sample heart failure patients, tend to live at a lower blood pressure, if you will. Or how much of that was because of healthcare utilization?

There was a paper that was also done with this dataset merged with another that looked at the quality blood pressure control among patients that were getting a neurologic procedure [unclear 28:23] versus a cardiac procedure, in terms of cardiac catheterization with stenting. And post-MI patients that had a cardiac procedure were more likely to get to goal blood pressure than stroke patients were. And I think that was actually largely driven by the number of cardiology visits. So we also used this to say, okay, when we go on site visits, we should probably talk to a cardiologist to see what’s working for them, what’s not working, and what those caring for stroke patients should do to learn from them.

And I also found it interesting that people that were diagnosed with depression were more likely to obtain optimal blood pressure control. And really the only way I could explain this, at least at this stage, is that you know that a lot of people after they’ve had a stroke have depression, but may not be diagnosed with it. So among those people that were diagnosed with depression, perhaps they’re more likely to be treated. And then we know that depression could influence medication adherence.

So looking at adjusted odds ratios in terms of achieving goal blood pressure. Again, if someone had a prior stroke that had no influence in terms of if someone had goal blood pressure, people with it can come and history of heart failure were more likely to get to goal blood pressure. People that were current smokers were not likely to get to goal blood pressure. And people that had their blood pressure under control previous to the event were not likely to get to goal blood pressure. So the idea being is that, again, people that have had in control blood pressure continue to have it even after a cerebrovascular event.

And interestingly, having a blood pressure point of care document at the time of discharge was not associated with obtaining goal blood pressure. So [unclear 30:30] contrary. So this also prompted us to ask what types of things are documented in terms of caring for blood pressure, and who’s writing those recommendations? Who’s reading those recommendations? And is this really effective or not? So what we did was try to combine administrative data, chart-review data, and then next going to interview data.

And then what we did was I’d racked up a lot of frequent flier miles and phone minutes just talking to providers, either neurologists, primary care providers, cardiologists, but also quality management personnel, and hospital clinic administrators to get a sense of how business is done in terms of managing patients with cerebrovascular disease. But then also we asked them to identify what their role was in the management of their care. Again, having that concept of the spectrum of ischemic stroke care in the back of my mind. But then also, what were their role in risk factor management? And then how well risk factors were being delivered. And what were the barriers and facilitators? And then also asking about what would potential interventions be in theory, but also in practice? How would they sort of play out in a given VA medical center?

So this was also my first foray into using NVivo, which I really enjoyed and continue to enjoy using. So we audio recorded interviews and had them transcribed, incorporated them into NVivo, a project file. And then we as a team [unclear 32:06] to apply codes as well as CFIR constructs. And then we did content analysis to generate codes and validate findings. And then we also incorporated quantitative data in terms of, for example what quartile of blood pressure control was the VA medical center at? And incorporated this into one project file. I recognize not many of you on the phone, the cyberseminar, probably use NVivo or TI or other software. So this is what a matrix [unclear 32:37] looks like.

So, for example, if we wanted to see perceived barriers to hypertension management as well as facility characteristics, so this was just sort of one analysis that we did to get a really composite sense of how business is done. So we ended up identifying some really interesting themes, I think. So the first one was that it was difficult for specialists to declare themselves as the owner of clinical care beyond the hospitalization period. And specifically for hypertension, we learn that no neurologists really were willing to adjust and, more specifically, intensify hypertensives.

But then on the outpatient arena, it didn’t seem that neurologists or primary care providers were aware that someone else wasn’t managing the blood pressure. So in effect, pretty routinely billed providers thought that someone else was doing the job. And often times blood pressure was not being effectively managed. And then to sort of drive down a little bit more, primary care providers often times expressed a hesitancy about titrating blood pressure medications after you’ve been, sort of is this phenomenon called cerebral autoregulation where because the brain is not getting enough blood, the physiological response for most stroke patients is to increase the blood pressure.

It was traditionally thought that this lasts about two weeks. It actually only lasts a couple of days. And we had some providers tell us that people autoregulate for weeks to months on end after someone’s had a stroke. But then we also found out that there were really no protocol or processes to transition care. And at the centers that we want to, many patients were admitted to neurology care as the primary service or admitted to a hospital service with neurology consultants, but then getting a majority of their primary care, of their risk factor management done in primary care. And it really wasn’t a well orchestrated way to help facilitate these hand-offs. And then providers were often times reporting that the symptoms of poor blood pressure weren’t especially selling these patients. More specifically, there were other things that were more important to patients than just managing blood pressure.

So along with these data we also wanted to get a sense of how we could map out some things onto the CFIR conceptual framework. So for people on the cyberseminar that are not familiar with the Consolidated Framework for Implementation Research, there’s domains are constructs. And it’s especially useful, not just in terms of implementing intervention. But also we’ve been finding it quite useful in terms of developing interventions, as well. And here’s the schematic that’s probably going to be familiar to most people. But the idea is that with any type of intervention, once it’s developed, there really has to be some degree of local adaptation for it to work, and work well within a given healthcare setting.

So we were able to map out the themes on several of the constructs. So here’s just a snippet of some of it. But, for example, with lack of clinical ownership, mapping onto the culture construct. So primary care providers are quite adept and well-trained at managing blood pressure. People don’t become a card-carrying neurologist without ever managing blood pressure as an outpatient basis. But then also, lack of awareness about blood pressure management mapped out onto networks in communication, and then in terms of [unclear 36:45] certainly knowledge and beliefs. But then also networks and communication came up again, as did knowledge and beliefs in terms of for some of the processes. And connective urgency, respectively.

So I tend to think about processes of care in terms of Venn diagrams and pathways, and the pathway part may be the neurologist in me. We see a lot of these overlapping Venn diagrams. And whenever I think of overlapping Venn diagrams that don’t overlap completely, I start thinking as stroke neurologist about blood supply. So a watershed stroke is a type of stroke that occurs typically between two arterial supplies that abut one another. So in these watershed areas, the blood supply actually comes from two different territories, if you will. And really needing adequate contribution from each territory in order for the area seen in purple to get adequate blood supply. So when one vascular territory isn’t doing its job or both of them aren’t doing their job, you get this watershed stroke. So in some ways I think that the Venn diagrams that we’re seeing here where different provider types may not be contributing as much to the management of blood pressure lends itself to the idea that this may be sort of a watershed effect.

So apart from the literature and apart from using multiple data sources, we wanted to get a sense of what are the other things, other barriers that we may not have identified. And one of the things that I’ve done over the last three years is I’ve made up for the fact that when I was a kid, I never got to do karate. So I always wanted to – maybe because I was a big fan of Karate Kid, but I always wanted to have some kind of belt. And in Six Sigma, based on the number of projects and the types of skills that you acquire, you go from white to yellow to black to green black, or green to black belt. And the idea is that it combines two different quality improvement methodologies in the one.

So with [unclear 39:15], it’s really about the process of improvement but identifying areas of waste and trying to eliminate them, and then recognizing that there are some things that the customer really values, and there are some things that the customer doesn’t value. And some of those things could be waste. And with Six Sigma, it really tries to identify sources of variability. [unclear 39:41] kind of process, but tries to create some sort of standard work, if you will. So Sigma is designed for variability. And then where Six Sigma comes in is that it’s sort of six standard deviations away from the average. So it’s thought to be the best that a given process could get in terms of this concept of defect-free care.

Some other things in terms of thinking about forming the development of intervention, so some of you may have seen or participated in drafting this transition of care from hospital to home. Some of the takeaways I have from it was that a lot of interventions are only hospital-based, and many of them didn’t really get input from outpatient providers who would be doing the most longitudinal care. But it seemed like a lot of the really good, successful intervention bridge the inpatient/outpatient setting, but also have more local components along with it.

And then being at this being Six Sigma, these are some of the typical wastes that the process tries to identify. So in using Six Sigma and recognizing that some patients transition from inpatient care to outpatient care, what we did too at a couple of the sites were value-stream process mapping. So the neurologist in me loves to localize along a given pathway. And so by analogy this is the pathway by which a given patient will flow from the inpatient to the outpatient setting. And then here, one resident sees them and another resident picks them up the next day. They’re ultimately seen by attending, they’re cared for, managed, and then ultimately discharged.

But then we’re finding that oftentimes patients were not getting a timely follow-up in primary care. And about more than half of the time they weren’t seeing a neurologist for their follow-up either. So the idea is that we found that there was a long wait time and poor communication between some providers, as well as some redundancy in how care was delivered. So looking at what we know from the literature, looking at what we learn from various data sources, including the process mapping and other Six Sigma techniques that we used, we took a step back and said, “okay, well what should an intervention look like?” And we thought that it should be multi-faceted, and it didn’t seem like there was one lesion site. And if it’s multifaceted, the idea that try and bundle different types of interventions, or bundle different components of a larger intervention, recognizing that different lesions, if you will, in the pathway may be more amenable to a different type of a different component of an intervention.

That should ideally start with the hospitalization period and then continue on as an outpatient, but also recognize that there also probably some Veterans that we should work harder at, specifically those that have a history of uncontrolled blood pressure coming in the door, but also having uncontrolled blood pressure as they leave the door. And then the idea is that organization-level interventions could be really helpful. And one of the things that I really like about organization-level interventions is that if it’s done right it could use existing VHA infrastructure. It could use expertise there.

So the idea is that if you develop something that’s good, it could be sustainable and spread to other sites. But the idea is too that it also recognizes that there are some cultural considerations in healthcare that, I think there are realities, that different types of providers get different types of training. So for example, there is only one type of provider that can take out an appendix. And they’re not the ones that are managing blood pressure, for example. But recognizing that there are these watershed areas between providers, as well as what patients are reporting, that in an organization could help buttress those areas and really be the steward of looking at how risk factor management is done.

So again, going back to the idea of focusing on these care transitions as well to longitudinal outpatient care, we developed a complex bundle intervention. So we developed this transition to care note, which is completed during the hospitalization period, but it also used pretty clear descriptions of what are some of those blood pressure medication changes that occurred in the hospital. Just based on some preliminary work, it looks like on average there are six different changes to blood pressure medicines during a three to four-day hospitalization period. And one of the things that we were hearing is that for people that have tried to read discharge summaries, they are frequently of variable quality. So we wanted to try to come up with the note where it would clearly articulate the things that should be done but also the things that were done in the hospitalization period. We also developed the stroke risk factor education program that incorporates the American Heart Association/American Stroke Association guidelines but also really was developed in concert with several leaders in stroke care throughout VHA. But it also recognizes that there are other reasons for not obtaining goal blood pressure. Sometimes medication non-adherence. We know that depression is common and cognitive impairment is common, and how to look for those effectively as they may affect how patients are able to take their blood pressure medication.

But then also one of the things that we heard in terms of intervention, thoughts from potential end-users is that sometimes they don’t have all of the expertise locally. And were there ways by which virtual care could be used, either through SCAN-ECHO or other modalities, such as e-consults, where the individual providers could get a little help. So I think this is a little bit more of the same in recognizing that we want to have some concrete questions.

But then also I just wanted to review some of the ways by which we’re going to evaluate both quantitatively and qualitatively. So we want to get a sense of how often the transition care is being used. And then also we’ll be asking in terms of the feasibility and acceptability of this one-year pilot intervention which will be forthcoming, actually start in about six weeks. But then in terms of the risk factor educational program, getting a sense of how well it’s received. But then also seeing are there changes in documentation as well as management. And then also how often virtual care is being used as well. I should note that we’ll also be collecting preliminary metrics to see how blood pressure changes over time in our pilot facility.

So as we all know, research is a team sport, and these are some of the people that have helped me along in terms of the work that I do in helping to understand health services research and implementation science, as well as some of the operational partners that have been really important and supported this research in really developing it. So I think what I do is pause there. And then if Dawn is joining a line, these are some of the discussion questions and that we may have some questions in the panel as well.

Dr. Dawn Bravata: Jason, can you hear me?

Molly: We can, thank you.

Dr. Dawn Bravata: Yes, hi, Jason thank you so much for that. I wanted to talk to you about two different aspects of your presentation today. I was hoping that you could comment a little bit on the role of the HSR&D CDA in your professional development, and then talk a little bit about the specific research that you are doing.

So in terms of the CDA, I just had two questions that might be of interest to a general audience. The first is, as you showed in your last slide, you have two very robust but geographically separate mentoring teams. You have teams and really senior people local to you in West Haven and then many of us, especially your implementation advisors, are in Indianapolis. And I was just wondering for the people who are on the phone who are either mentors or who are with the CDA program or who are maybe CBA recipients themselves, if you could just maybe give some advice about that.

Dr. Jason Sico: Yeah, absolutely. So I think probably the first thing I would say is not to shy away from developing collaborations and being mentored by people that aren’t geographically there. Because oftentimes, we’re all at really great centers, not every center has everything that is possible. And I think QUERI absolutely recognizes that. And I think, to mirror that, recognizing that VHA has a lot of really great researchers. And again not everybody has the expertise that is needed, which is why we reach out, to collaborate but also to be mentored.

And, I think, by interest I decided to MapQuest it, which probably dates how old I am. So it’s 758 miles between West Haven and Indianapolis. So as one could imagine, that doesn’t always afford the luxury of the random hallway conversation. And we all know how valuable those hallway conversations can be. So really communicating clearly with everybody on the team, locally as well as those that aren’t at the site. But then also it’s really important to have one-on-one meetings at the hospital in person, but more often than not, virtually with mentors. But also recognizing that it’s really important to bring the entire mentoring team together.

So some of the things that have worked well, so on a weekly basis, Dawn and I meet. And on pretty much a monthly basis John and I meet, and Bob and Theresa at other times. But then once a month we all meet as a mentoring team. And that really works well. So not only do we talk about the status of grant proposals, projects, papers, but also my overall career development in terms of gaining methodologic expertise but also where things may fall into, for example, promotions at the university affiliate. So I think it’s really important to recognize that there’s a lot of value that can be done. But communication is really important, and then also I think just sort of recognizing that it’s work for everybody, for distance mentoring, and just saying thank you as often as you can without sounding like you’re thanking them too much.

Dr. Dawn Bravata: I guess I would just add, I know that Theresa is on the line as well, but I would add that I think one of the things you do really well is that you invest in your distance mentoring team. And so just for people listening in, Jason makes a point of travelling to Indianapolis at least once a year, and he stays for a few days when he’s here, meeting with different people and presenting at our center. And so he’s kind of become sort of a distant cousin to our center here in Indianapolis. And then mostly we meet also one time in addition to that visit at a national conference. And so I guess I just wanted to kind of flesh that out a little bit.

One other question about your CDA is, not all CDAs through the HSR&D service are focused on implementation. Some are more classic health services, maybe even clinical trial kinds of research. And yours is squarely within implementation science. And I was just wondering if you might reflect a little bit about how that choice to focus on implementation science, implementation within the VA, how that is – what challenges that might present. And if you could maybe reflect on that part of your CDA.

Dr. Jason Sico: Yeah, absolutely. So obviously I really have quite enjoyed implementation science and have continued to learn every day about it. I think one of the things that has been more of a challenge recognizing that it’s not just about the research. But it goes beyond even fostering partnerships in Central Office, for example. But recognizing, especially when thinking about developing interventions and thinking about them and hopefully scaling them up at some point in time, that there could be some really major road blocks. So for example, with the pilot that we just talked about, ideally would have started seven or eight months ago. And then the first site that we had earmarked and said, “this is fantastic and we’d love to have you come”. And then after we had done some of the hiring and gotten IRB approval, local leadership sort of changed their mind.

I think recognizing that things had happened quickly and that it’s important to have sort of sustained buy-in. I think another challenge has been more of a moral question. So for example, taking the 30,000 foot view and using administrative data, being able to see how well some sites are doing and how not great other sites are doing. And offering some sites that aren’t doing well and sometimes sites that are doing quite poorly in a given metric, if it’s blood pressure control or something, but also seeing how they do in outcomes. So with a recent Merit that we put in had recruited six sites in total. And one of the sites that was high volume and absolutely needed help with blood pressure control, needed help with a lot of things, if you looked at how well they were doing in terms of other outcomes. So 90 days after someone left their hospital with a stroke, 90 days later someone would either have a heart attack, heart failure, another stroke, or they would die. So a third of the people that were leaving that VA Medical Center, bad things were happening to them. And I shared that data with the site and I guess probably the moral question that comes in is that they said, “well, thank you but no thanks, we don’t need the help”. So recognizing that with implementation science, especially if there’s an intervention component to it, you can only intervene at places that have you. So I think that’s probably been one of the bigger challenges.

Dr. Dawn Bravata: That’s very interesting, I really appreciate that comment. I see that we only have three minutes left, and I’m not seeing that anybody else is having questions.

Molly: Oh actually, I don’t mean to interrupt, but we do actually have a whole bunch of pending questions.

Dr. Dawn Bravata: Oh, okay, very good, so let us please ask Jason those questions.

Molly: Excellent, well thank you very much for your comments and dialogue. So we’ll get right into them. Could relationship of depression to BP control simply be a consequence of more frequent post-charge visits?

Dr. Jason Sico: Yeah, that’s a really good question. So we’ll go up to some of Christianne’s work. But it looked like people that had higher tiers of blood pressure were still being seen about the same number of times. So you would think that absolutely if people were being seen more often they would have more opportunity for treatment intensification. And we were hoping that we would see that, but that really wasn’t the case. So for example, in this slide, the patients that had the systolic of 141-160 over the twelve months after the discharge on average had about two opportunities for intensification. And for those with a little higher blood pressure, they had a little bit more than two. And I’m pretty sure, if I remember correctly, the P values were about the same. But then even when I see two opportunities where treatment intensification, I will comment on someone’s blood pressure after [unclear 57:30] stroke with their primary care provider. And to me this seems like it seems like if someone’s blood pressure is that elevated and you only see them twice in the year to intensify their blood pressure treatment, that may not be enough. So yeah, I think that point’s well taken. At least it seems like in post-stroke, the number of opportunities was about the same, regardless of how high their blood pressure was. And ideally with this intervention people will not only get seen more often, but those visits will be more frequent.

Molly: Excellent. Thank you for that reply. Are you able to stay on and answer these last few questions, Jason? Is that okay?

Dr. Jason Sico: Absolutely. Absolutely.

Molly: Okay. Great. If anybody in our audience does need to exit, we understand. We will answer all the questions to get them on the recording. If you do exit out of the session early, please take just a moment to fill out the feedback survey that will populate on your screen. We do look closely at your responses. So the next question: Big problem in other SCAN-ECHO projects has been motivating PCP participation. What can you do address that?

Dr. Jason Sico: Yeah. So over the last year I’ve been doing a monthly stroke SCAN ECHO. And if people are interested, they could email me and I could get them more information about that. Where it’s a combination of talking about risk factor management, individual risk factors, what are some rehabilitation needs. And so not only will I email everybody that has commented. I typically get between 30 and 60 people, providers. And I’ve been doing it for about a year. I have not gotten a single email, nor have I gotten a SCAN ECHO consult, despite the fact that all my slides have like a step by step instruction, in terms of this is where you go in the order set. So nobody’s given feedback. And I send them other options to get in touch with me. So no one ever comes with cases that they want to present, nor do they come with specific questions. And I’ve even targeted people that I know come every month. And say, “is there anything specific? Or can I help with out with that, help out with the patient?”

So to SCAN-ECHO, I haven’t been able to get a lot of primary care active participation. Sometimes, I usually get three or four questions at the end of the session. But yeah, so in recognizing that my understanding of SCAN-ECHO to begin with was that people come with questions. And if you were sort of a time period by which you have access to specialty care. I have to say one of the things that some additional outreach efforts have done was I’ve had people say, “oh, well, if I do the e-consults, will you deal with them?” And I say, “absolutely”. So it’s generated other venues by which I could do specific outreach with specific patients for providers. But yeah, and one of the things I’ve been thinking about with SCAN ECHO is exactly that, like how to get more active participation from primary care providers. And even, I give one next week. And I’m going to have a survey in terms of like lists of topics they want to discuss. But yeah, unfortunately, I don’t, I’ll let people know how that works. But in terms of active dialogue during a SCAN ECHO session, I’ve not had any.

Molly: Thank you. The next question is: How to change the issue of “responsibility confusion”. Neurologists think the primary care is managing HTM. So how to change the issue of responsibility confusion where the neurologists thinks the primary care is managing HTM.

Dr. Jason Sico: Right. Absolutely. So kind of going back to the culture component of CFIR, I absolutely don’t think that it’s possible to change who wants to manage blood pressure. But I think that clarification is absolutely necessary. So one of the other things that we’re doing with the pilot site is actually the first time that – so because of the prework to get the pilot started – it’s the first time that the head of neurology and the head of outpatient primary care and the head of hospitalist medicine have met for the first time together in person.

So virtually what we did, so they met. And then I, we did a Microsoft Lync meeting and then talked about how to address this responsibility confusion. And one of the things that we came up with was a project charter. But then also that kind of recognizing that what primary care providers really wanted was wanted to know that the patient was there. But then also a little bit more direction. And if they had that direction in terms of post-stroke hypertension management I think they could probably do it from there. But also one of the things that we heard from that mini-kick off session was that they also really wanted to get a sense of what other things were available to help them manage blood pressure. So there they have a pretty active clinical pharmacist that are under-utilized, as well as a home telehealth program.

So I guess to go back to the specific one about addressing responsibility confusion, we’ve gotten the stakeholders together and asked how best to sort of address this. One of the things that actually is really nice that came out of that meeting was that in getting a sense of what organization leadership is interested in, so people may be aware of what their [SAIL? 1:04:08] score is. And actually facility level hypertension management is part of the [SAIL? 1:04:10] score. So the place where we were piloting intervention is that they just got two star designation the last go-round, they were previously one star. So they’re really interested in any way to improve that [SAIL? 1:04:27] score. So they’re quite interested at looking at ways to improve blood pressure control. But also the other part of the [SAIL? 1:04:34] score is care condition. So one of the things that we’ll be doing is also, so by addressing the responsibility confusion gby etting the shareholders together, but also saying as a facility this is also beneficial because there are some broader implications. So in fact the head of that VA medical center, he just emailed me on Friday and asked me, “could you come sooner?” But yeah, so look at responsibility confusion really soon. Getting the decision makers and saying, “what’s the best way to do it?” And then having clearly identified roles has been very helpful. But I’ll have new data on that in a couple months.

Molly: Thank you. Can you provide data for specific medical centers on how well we are doing with regard to BP control for our stroke patients? If it is already collected, can we access it? Thanks.

Dr. Jason Sico: Absolutely. So in fact that’s actually a big part of one of Dawn’s QUERI projects is, so Dawn, I don’t know if you wanted to use this time to talk about Prevent. But moreso for TIA patients than stroke patients, but the idea is that to be able to tell a given facility how they’re doing, and then teaching them how to run those reports.

Dr. Dawn Bravata: Yes, that’s right, that as part of a project that’s funded through the QUERI program here in Indianapolis called the Prevent program. Any interested site can have access to a broad range of post-TIA performance measurements, hypertension control being a particular problem area for very many VA facilities. And that’s one of our highlighted metrics. So if anyone is interested in participating or receiving those data, all they need to do is email me or Jason.

Molly: Excellent, thank you. The last question here: Are all VA hospitals designated stroke centers and ready to administer TPA drug to Vets when needed?

Dr. Jason Sico: Right, so around 2009 there was something called the acute ischemic stroke directive. And it was a really nice collaborative effort between neurology and specifically Glenn Graham, who is the national head of stroke care and the head of emergency medicine. And it basically said “okay, well,” and actually this is a prime example of using administrative data and some of the dataset that we’d used, and that talks about here, to see how well, or how often TPA was being administered across VHA, and Dawn will keep me honest with the number, but I believe the number was 9.8% of eligible patients across VHA were getting TPA.

So because of those data being back to operational partners, saying “gee, less than 10% of people are getting a standard of care treatment”, which by the way actually at the time was maybe better than the community? Was to say okay, well, to come up with an acute ischemic stroke directive. And every VA medical center had to designate themselves as a facility that could give TPA 24/7, a facility that could give TPA on a limited hours basis, or a facility that was not able to give TPA at all. And if you were either limited or the third type of facility, then you had to come up with a way that you could very quickly transport people that come through VA to the nearest certified stroke center. So VA medical centers had to self-designate if they were along those three tiers. And actually the updated acute ischemic stroke directive should be coming out within the next couple weeks. But yeah, so VA medical centers have to designate if they are able to give TPA 24/7, and if not, during which time they can or cannot give it.

Molly: Thank you. Well, that was an excellent presentation. I do want to give both you and Dr. Bravata the chance to make any concluding comments if you’d like. Dawn, would you like to start? Are you still on the call?

Dr. Dawn Bravata: Yes, I just want to say thank you to Jason for sharing your work, and I think that the work that you’re doing is really very likely both to improve stroke care but also to teach us about how we would improve risk factor management, specifically vascular risk factor management, for a variety of disease conditions. So for example, patients after congestive heart failure, and so on. Because I think that a lot of the lessons that you’re learning are going to be applicable to other kinds of special veteran populations. So I’m really excited to see what you’re learning over the next couple of years.

Molly: Jason, I’m going to interrupt. Thank you Dawn, very much. Jason, can I get you to scroll down to the last slide really quick while we get your concluding comments? I just want to make sure that everybody has the information. If you hover over the bottom left hand corner I think there’s an index to scroll. Or you can just advance – there you go. A little bit of a lag time, but that’s okay, you can go ahead and just give us your concluding comments while we continue on.  
  
Dr. Jason Sico: Oh sure, absolutely. So again I want to thank people for the really excellent questions. And if people have other questions, please feel free to send me an email, it’s [Jason.sico@va.gov](mailto:Jason.sico@va.gov) or that edu. Sometimes I’ll have people kind of pursuant to their comments at the beginning of the conversation, that “I tried to email you, but it kept getting bumped back, but then I realized that I spelled it S-I-C-K-O”. So definitely not sicko or psycho. But I think that again, we’re interested in how primary care should communicate and coordinate care for Veterans with a myriad of conditions, specifically neurologic and more specifically those with a cerebrovascular event. I think one of the things that I’ve been really excited about to find the research has also been the use of systems redesign and Lean Six Sigma as an implementation science strategy. So if people want to know more about that, please feel free to contact me. Most VA medical centers have Lean Six Sigma personnel. Typically they live in the quality management or quality improvement office. And a lot of them are certified to train people to Lean Six Sigma methods. So that’s definitely an option available at a lot of VA medical centers. And if you’re not sure if your center has that, let me know and I could actually help find that out.

Molly: Excellent. Well, thank you once again for coming on and lending your expertise to the field. And thank you to Dr. Dawn Bravata for joining us as a discussant and for Q&A. Thank you to Barb Elspas, and the entire CDA Enhancement Initiatives team for organizing these monthly sessions. These CDA presentations take place on the second Tuesday of each month. Please keep an eye on your email. In the next day or two we will be sending out the information for the next one. Thank you to our attendees for joining us. I am going to close out the meeting now. Please take just a moment to fill out the feedback survey that will populate on your screen. It’s just a few questions. But we do look closely at your responses and it helps us to improve our sessions as well as the program as a whole. So thank you once again, Jason, Dawn, Barb. And everybody have a great rest of the day.

Dr. Jason Sico: Great. Thank you very much.

Dr. Dawn Bravata: Thank you.

[END OF AUDIO]