

CHERYL BUSHNELL: I'm going to start out by just mentioning that this study I'm going to tell you about was funded by the Patient-Centered Outcomes Research Institute. And if those of you who are not familiar with PCORI, it was actually a part of the Affordable Care Act. And so without getting too political, we do know that the Affordable Care Act is probably not going to be around much longer. I think the question is whether the funding for important research like if pragmatic trials and effectiveness will still continue. So on that note, we're only going to get more positive from there.

So my objective today is to help you understand what population health is this is a relatively new concept. Honestly, four or five years ago, I had no idea what this was but. It's now really a buzzword in all health systems. And just talk about how population health and stroke care and across the continuum is a really important facet of value based care.

And then I'll also talk about the gaps and challenges with post-acute care for stroke. And also how compass can really address those gaps, especially here in North Carolina. And so what is population health? I actually had to look back at literature going back to 2008. And it actually evolved from the concept of public health and people felt that public health was too narrow of a term. And so they decided that they would kind of involved more of a population health to include the determinants of health and health outcomes. And so that's really kind of what population health is.

And actually, I think one of the things I'm curious about is, how many people believe that the US has the number one health outcomes in the world? Well, the answer is, we are number I think 40 or 41. We are behind Cuba and just ahead of Costa Rica. So that tells you that our population's health is really not that great. We still have a lot of work to do. And in that Affordable Care Act was really just trying to improve outcomes at a better cost or lower cost and with better quality. And so this is basically what we're trying to accomplish with population health.

And then what I've included here is kind of a corporate definition of population health, because this is a big industry now. And that is basically the aggregation of patient data across multiple health information technology resources, analysis of that data into a single actionable patient record, and the actions through which providers can improve both clinical and financial outcomes. So this is kind of how it's evolved over time because it's not just understanding what happens to people is, it's where you can intervene to actually improve outcomes.

And also to understand your population from a medical psychosocial and functional point of view. And so this is just a very simple diagram that shows you the health outcomes in the distribution that there's a back and forth between the determinants of health and the policies and interventions that can impact both.

So I just want to have some people shout out. What are some health outcomes that we care about? Anybody? Mortality, that's a great one. What else? disability, good. How about recurrent stroke, since this is a stroke conference, or having a stroke at all. And so quality of life is another really big health outcome and this slide just gets into a little more detail about some of the determinants, such as medical care behaviors, social environment, physical environment genetics.

And then the different population health outcomes and they've really focused on mortality and quality of life here. And you can see these are the disparities that can occur for impacting outcomes. You've got race ethnicity, socioeconomic status, geographic location, and sex. And there's even more to it than this. Obviously, has a lot to do with the living environment of a lot of people. And so though those disparities impact both mortality and quality of life. And there are policies and interventions that can impact both the outcomes and the determinants. And so this is kind of what population health is doing.

How many folks here are using Epic for your electronic medical record? So a large part of the group here is using Epic. And Epic has a platform called healthy planet, and this is a way of managing patients over a large population and in specific registries. And they use retrospective real time and predictive analytics.

And what that means is that they can, for example, identify somebody from the record who is 55 years old has, a body mass index of 45. And then they can actually generate what kind of risks that patient would have based on those demographics. And have even a little pop-up BPA. We all love those, right? The BPA comes up and says, your patient is overweight or obese. You should probably consider checking them for diabetes. That they should counsel on weight loss and physical activity. So those are just some of the kinds of things that can happen as a result of understanding a patient in their particular situation, and some of the risks that they may be at based on their population characteristics.

And then they can use these chronic disease registries for a high cost population and co-morbidity management. And as one example I just found out that you can actually have external data feed into a healthy planet registry. And that can actually really round out the characteristics and the outcomes that are occurring from that patient. For example, you can have administrative claims from Medicare or other insurance companies that can actually feed into the registry. And then you can understand that this patient, in fact, did get admitted to a nursing home. Or this patient was readmitted to the hospital within 30 days or 90 days and had a recurrent stroke, for example.

So a lot of that information is available and it just requires the IT resources to be able to put it all together. So this is a really exciting way in my mind because of my work with outcomes research and how we always had to have an external research platform in order to be able to track outcomes. And now it's actually all coming together to the medical record. And this kind of data is so important for understanding our population and how we can actually improve the health of the people that we are treating.

So what I'm going to do is just kind of walk you through the process that I've gone through in terms of the research platforms to quality improvement, and then to discuss our pragmatic trial. So I was involved with a registry when I was still at Duke and it's called AVAIL and it was Adherence eValuation After Ischemic stroke-- Longitudinal. And what we were interested in doing was figuring out how to understand medication-taking behavior in stroke patients.

And so we looked at persistence with taking the same medicines at discharge and three months later. And what we found in this really complicated table, is that we had really important factors that we could do something about that really impacted adherence to medication. And that was just the sheer number of medications they took, whether they had financial hardship, if they understood why they were taking their medicines, understanding how to refill them. Because we send people home with a 30 day prescription of medications, right, and zero refills.

So if a patient finishes out there 30 days and they haven't been back into the health care system, a lot of times patients have told me, well, I didn't get any refills so I just assumed that I wasn't supposed to take it after 30 days. So a lot of this is education about medications and how they need to be continued after a stroke to try to prevent another one.

Another one is if they have poor quality of life, and if they have a lot of disabilities. So those are the kind of things that can impact medication taking behavior and so what we did was try to develop a method of coaching about medications. We thought, well we know that having a lot of medications and not understanding them was a factor in the continuation of taking those meds. So we actually did a coaching study and found that we could actually impact their ability to understand their medications.

But in the process of doing that, we also understood that these patients actually had much more going on than just taking medications. It was about transportation to their appointments it was about actually getting the therapy that they were prescribed. So this is just the tip of the iceberg, and so we actually started to focus more on transitions of care. And so this is where TRACS comes in which stands for Transition Coaching for Stroke.

And so in 2011 we developed-- the hospital actually invested the neuroscience service line and the Department of Neurology invested in having a person who is going to be managing the transition coaching. And so they invested in that person and we developed a registry within REDCap, which is just a database, and we started enrolling patients and we realized that we needed to have a clinic that was going to see these patients. So we hired nurse practitioners to do that.

And after we had one stroke nurse practitioner we realized that we clearly needed two because, they were going back and forth between the inpatient and the outpatient setting. And then we added a nurse in 2014 because the nurse practitioners were spending all day on the phone calling these patients. And we needed to have them in the clinic and have the nurse who could take care of the phone calls. And so as of 2015 we had 675 patients that were enrolled in this program. And basically what we did was just develop a structure for early phone calls after follow up and then a clinic visit that was structured, and evolved over time into the intervention that I'll tell you about.

And so what we think this is kind of a nice model for a learning health system. This is what academics is all about is that we start with an idea. This was a quality improvement program neuroscience service line and Department of Neurology funded. And then we developed this into an intervention that we got funded by the Patient Centered Outcomes Research Institute that we're implementing here in North Carolina.

Wake Forest is the Vanguard site, meaning that we are implementing the model of care and not being randomized. And that is an idea that can evolve into an epic stroke registry eCare plans patents, et cetera, better outcomes, and then use this to benefit the health system in terms of chronic care models beyond stroke and also medical school and residency curriculum. So that's kind of what a learning health system is taking some research and moving it into implementation and education and use within and scalability within other academic health centers and also other health systems across the state.

And so I'm going to talk to you now about COMPASS and I just want to introduce you to Pam Duncan who is our PI, and she has over 30 years of experience with outcomes research stroke and Rehabilitation Research

And Wayne Rosamond who is another Co-PI, And he is the director of the North Carolina Coverdale Registry. And he has been instrumental in recruiting hospitals for COMPASS.

And then Sabina Gesell who is our expert on stakeholder engagement. And without this we would not have been funded PCORI relies on stakeholder input on every single aspect of your trial. And so she was instrumental in making sure that that happened, and was very methodical about it.

So I show this graphic as a metaphor for what happens after a stroke. And I love the scaffolding is sort of a metaphor for how lower revealed to the brain, and how we're handling the stroke after it's happened. So we have this recovery process where we're building new connections, and a lot of that is occurring through, right now, just a variety of therapies. We don't have a lot of interventions to actually change the way our brain works after a stroke. But we do know that therapy initiated early, and has regular frequency and intensity structured and progressive can actually improve therapy and recovery.

And then the other important piece is neurovascular health, because this is what is going to keep that patient from developing a lot of problems along the line. SO in other words, once you have your blood pressure, diabetes, cholesterol improved diet exercise and smoking cessation, all of it that can actually lead to better brain health, reduce the risk of recurrence stroke, and reduce the risk of dementia. And so this is an incredibly important prevention and priority for patients after they've had a stroke.

And so we know that TPA is incredibly effective. And it was 20 years ago that that was approved by the FDA for acute stroke treatment. And we have endovascular treatment now, which also is extremely effective in the right population of patients. And so this is obviously changed dramatically the way we treat stroke patients compared to 20 years ago. But what we know is that that is just a short snippet of time of these patients' lives. And so they leave the hospital with some amount of deficit. And even if they look like they're normal when they leave the hospital more than likely they have at least some lasting deficit.

And unfortunately the patients-- this top line here shows the patients that go home without any of post-acute services. So some are in the order of 45% even through 2011 we're going home without any post-acute stroke services.

And what's worse is that if patients are under the age of 65, 65% of those patients go home without any services. And so this is a real gap in care that we know can happen, because even if patients are so-called normal neurologically when they go home, they have tremendous anxiety about having another stroke, there can be depression or some other cognitive deficits. A lot of things can occur in these patients after a brief stay in the hospital and excellent care, but then they have the rest of their lives to figure out how they're going to manage.

And so these are just a graphic showing you the gaps. And we're doing pretty well here in the hyper-acute setting, in the acute setting. But we have a gap here between acute hospitalization and rehab. That could be in the outpatient setting or home health. And then an even larger gap getting patients from their rehab to integration into the community. And this is what COMPASS is trying to address right here.

So we have core measures for all the acute measures or acute care that we're providing, but we don't have anything for the post-acute setting. So no quality. No pathway, no particular method for treating these stroke patients after they leave the hospital. And so what can happen? They can fall. Once they fall, they're more likely to have fractures. They can develop aspiration pneumonia if they have some dysphasia. They can develop DVTs, PEs. They're at risk for depression, as I mentioned earlier. And they can have medication issues or bleeding. And so all of this can occur after they leave the hospital.

And this is really important to health systems because they're at high risk of being readmitted. Currently CMS is designating about 15% a 30-day readmission as the national average. And if you get too far above that, then you're actually going to get penalized. So 30 day re-admissions are a real focus of a lot of health systems. But there are also re-admitted within 90 days, a little higher percentage. And then two-thirds within one year.

And so this is very costly and we are fairly confident that stroke is going to be one of the upcoming bundled payments, which means that you have 90 days and one sum of money to take care of this patient. And make sure that they get the best outcome from all of the providers that touched them during that 90 days. And so it's really important to try to prevent falls. This is going to be a common occurrence after stroke.

Really important to control blood pressure. This is very rarely controlled after stroke the ideal setting. And I bet it's less than 50%. We have some data here showing 30%, but blood pressure control is the lowest hanging fruit, so to speak for stroke prevention after discharge.

Now, it's also important to understand what kind of support that stroke survivors have, and caregivers are essential. So the people who do not have caregivers don't do as well. And the caregivers have new challenges. They're at risk of depression and having poor mental health, and they can become socially isolated. And so it's very important if you're seeing the patient back in clinic to also ask how the caregiver is doing, especially if they're having to help with activities of daily living and things that the patient never needed help with before.

And so as we were developing our interventional we asked our stakeholders what is most important to you. Stakeholders, meaning the patient's and caregivers. And they said we need positive messages. We have to be reassured that we're going to get better. And we talked about even in the emergency department at our TeleStroke forum yesterday. Even in the emergency department patients are asking me through the robot, well, am I always going to be like this? Am I going to get better? And so even in that early frame we have to be positive because patients will really be scared and they really give up early if they don't get some kind of reassurance that they're going to get better.

And the other thing that they really care about is not having another stroke. And this is a life changing experience. And so it's really important that they understand what they need to do to prevent another stroke. They also need support from peers and health professionals, and they need access to inflammation after they leave the hospital. So a lot of times they'll come home with a lot of stuff and you tell them a lot of things while they're in the hospital, and it really just kind of doesn't register because it's so overwhelming. And so they need to have that information after they get home and start to process what's happened.

And then they also want that the fact that all providers seeing the patients, actually know what's going on. So a lot of times you could be sitting there in your clinic, and another provider has seen the patient elsewhere. And the patient kind of assumes that you have those records from another provider. And it could be in a totally different electronic medical record, and the sad truth is that we don't have that information. And so what the patients really need is for all of the providers to understand what's happened and what their care plan is. And that's kind of what the eCare Plan is that I'm going to tell you about in just a second.

So I've given this talk to some academic neurologists. And basically what I think is absolutely true is that a large academic health systems are the best prepared for managing acute stroke patients and complex stroke patients. We can organize the things within the hospital to try to improve care as much as possible. I know that's true in other nonacademic health centers as well. But they are the least prepared for managing patients after they leave the hospital.

Trying to get a clinic that would have openings for patients to be seen quickly. That is really difficult in an academic setting. Integrating the hospital and the department that has clinics within their department, those two things can be very, very far apart. And this is an eye opening experience as we were recruiting hospitals for COMPASS. But Jean Washington is the chancellor at Duke, and he is an advocate for-- actually he was on the Board of Governors for the first PCORI organization. And he said, "To flourish-- indeed to survive-- Academic Health Centers must reconfigure and transform rapidly and broadly in size, speed, value, and innovation." And I would say this is true for large health systems as well.

And so what the big challenge is, is trying to navigate this continuum after the patients leave the hospital, because you have all these different players that are going to be helping the patient but usually they're completely siloed. And so for example, you've got the hospital's stroke neurology team, but then you've got to integrate with primary care, home health, community resources, and the outpatient therapists. And so this is a really difficult task. And I'll tell you that we didn't really realize how difficult it was until we started trying to do this. So this is kind of what our biggest challenge is in trying to take care of stroke patients after they leave the hospital.

So our goal was to design an intervention that would actually do all of this. That would improve recovery, improve their secondary prevention and recurrent stroke risk, and do it in a comprehensive way with coordination of services. So what we're doing is-- and we can't say that it's evident evidence based until we compare it to something. And so we're actually doing a trial where we're comparing usual care to our COMPASS model.

And so I have to call out Christina Condon and Sarah Lycan. They are the two stroke nurse practitioners that work with me, and they have been instrumental in developing the intervention I'm going to tell you about. They understand what patients are going through as they leave the hospital. They used to actually alternate back and forth between the hospital and the clinic. And so they understand those social issues, the anxiety. And they used to spend an hour with patients sometimes in the hospital before they went home just answering their questions, and trying to make sure everything is settled before they leave. And so they are instrumental in describing what we've been able to accomplish.

And we did actually test this model and published it in *Stroke* in April of 2016. And what we did was just look at our data from tracks, and this is looking at the 30 day re-admissions in particular. And what we found is that for the patients who were not readmitted, 76% of them came to our clinic and only 61% of the patients who were readmitted. And that we were pretty good at getting our follow-up calls with the follow-up calls had no impact whatsoever on re-admissions. And so what we found is that the follow-up calls increased the likelihood of coming to clinic, but there were not enough not enough but in and of themselves to prevent 30-day re-admissions.

And so when we did a multivariable model including all of the things that we know can impact 30-day re-admissions, such as multiple comorbidities, a prior stroke, and a previous hospitalization, also adjusting for stroke severity, we found that coming to clinic would actually reduce re-admissions by over 48%, so this was a nice validation of our model, it's not a randomized controlled trial, but it is sort of a reflection of over time this model can actually improve outcomes, if we can get patients to come to clinic.

And so now we've designed a pragmatic trial. And what that is, is-- this is just sort of showing you the difference between pragmatic trials and explanatory or classic randomized controlled trial. And pragmatic trials have a high external validity, meaning that it's valid because it's in an external real world in our environment. We have large sample sizes, simple design, diverse settings and it's Phase IV them in the scheme of randomized studies versus a randomized controlled trial, which is usually smaller, highly controlled, homogeneous population. And that often leads to problems with generalizability after the randomized trial is finished.

So what pragmatic research really involves is stakeholders. And what I mean here is not just patients and caregivers, but hospital personnel, therapists all the people who touch the patient. We have primary care represented in our trial, we have and we have a caregiver research expert, we have some quality improvement experts. And so all of these folks have helped us design this trial and make sure that it's doing what they think it should.

It is involving a diverse and representative population of North Carolina. Multiple heterogeneous settings, such as rural and urban locations. Important for outcomes for care decisions and policies it's a real world type of intervention. It's Integrated right into the clinical workflow. And it's hopefully going to provide the health system with a return on investment. So that's kind of what pragmatic research is supposed to do.

And from a pragmatic standpoint we would not have been able to do this study without any additional help from Wake Forest Baptist. So we actually have a wide variety of partners in COMPASS. USC is the data coordinating center and they were instrumental in the recruitment of hospitals, as well as the registry that we're using as a platform. We've got the Justus-Warren Task Force. We've got partners at Duke. And we've got the North Carolina Stroke Care Collaborative, which is the Carverdale registry I mentioned. And we have partners at East Carolina University. And we could not do this without AHEC either, so they've been instrumental.

And so just to tell you exactly what we're doing. It's a cluster randomized trial. What that means is that we're randomizing hospitals and not individuals. We are keeping the population as simple as possible, so they are just stroke patients who are discharged home. And they could have a hemorrhagic or in a scheme stroke or TIAA. We are not including patients who go to skilled nursing or to inpatient rehab. That is just an entirely different population, and that's probably Phase II of our plan to try to understand that more severe population.

But our primary aim is just to compare the effectiveness of COMPASS with usual care. And then we're looking at 90 days outcome which is a functional status. And that is with a patient reported outcome the stroke impact scale 16. And we have a lot of secondary aims. In fact, we'll have an incredibly rich database of longitudinal care. And we've got a caregiver strain as one of our primary aims, as well as all cause re-admissions at 30 and 90 days. We'll have claims data that will give us information through the year post-stroke, whether they were admitted to a nursing home, whether they got the therapy, whether they were readmitted for a stroke, for example, and in mortality. So all of that information and more will be in our database.

So this is kind of a schematic of the design and we've got 41 hospitals here randomized. Half of them are going to the intervention. The other half to usual care. We're collecting data for a year and about 6,000 patients. After a year we're going to transfer the usual care into the intervention. And then the intervention hospitals, we're going to set them free, and see if they can continue doing COMPASS for a year, and then we'll be checking for sustainability of the intervention through claims data. So this is going to be a very important trial in terms of understanding the implementation process and sustainability, and the return on investment from health systems.

So again, I mentioned we have 41 hospitals and 40 clusters. There are two hospitals that were randomized as a pair together. We have hospitals all the way from the Western part of the state to the coast, and I'll show you a map in a second. We anticipate 6,000 patients but 5,400 that will definitely have outcomes on. And then our first site started in August. We have 450 patients enrolled. So far. And we have just a few more sites that are now getting ready to launch the last 20, are getting ready to launch next month. And we hope to have our Phase I results in the spring of 2018.

And so this is a map showing you of our hospitals. We have a lot of the mission health system represented we've got Novant, we've got CHS, we've got a couple of Vident hospitals out here, big hospitals in Raleigh, Wake Med, UNC. And then we have Southeastern Regional here which was hit hard by Hurricane Matthew. They agreed to participate and they've signed all the paperwork and everything, but they are still kind of trying to recover from the hurricane. They had no water or electricity for a week after the hurricane. So we're anxious to get them ready but we don't want to push them, so we're giving them few extra months to get launched.

So this is kind of the representation. And you can see that we luckily have some representation of really the stroke buckle here in the eastern part of the state as well. And so what does COMPASS look like? This is our primary messaging, which is to use the actual directions of the compass as our acronym. And so we've got numbers, which is to essentially focus on blood pressure. Knowing your numbers is extremely important. And then E is for engage, which is to stay physically active, to engage in your recovery, to engage in cognitive activities, and to engage in improving communication, if that's one of the consequences of a stroke.

And then to ask for support if needed. This is often really necessary for caregivers. And the willingness to be managing medications appropriately and lifestyle changes. This is one of the important things that coaching can do after stroke. So our care model is really focused on defining the process and the structure of care. And so the process is basically to fold in all the different touch points for patients after they leave the hospital. So it's at discharge giving them the information and a blood pressure log, and then at two days, within two days getting a phone call to just make sure everything's going OK, doing the medication reconciliation.

And then within seven to 14 days to be seen in the stroke transition clinic. And what this is, is a very structured process with assessments that will get at their medical, psychological, and social functional different determinants of health. And then that information is actually used to generate an eCare Plans that is individualized to that patient's needs. So if a patient doesn't need therapy, that won't show up in their care plan. If they need help with medications, they'll get a list of possible resources that can help them with either access to medications or help from a pharmacist.

And so this is all actually what CMS is requiring for value based care, and so the care plan really does take care of that. Then the structure is having a registered nurse who can do the phone calls and provide the information to the patient, help with the clinic visit by doing the assessments, and then helping to make sure that the patient has their primary care appointments, that they are able to connect with the referrals in the community.

And the advanced practice provider, which in some of our sites is actually a neurologist but often a nurse practitioner or physician's assistant, they see the patient they do their evaluation that can feed the eCare Plan. They have a checklist for looking for complications and other issues that can happen. And then they provide the actual orders that need to be made at that time, whether it's home health or physical therapy, occupational therapy, et cetera. And then they make sure that all that information gets to the primary care physician. So all this is basically what the intervention is doing at the seven to 14 day visit there.

I mentioned the assessments and so a lot of it is assessing their fall risk, their physical mobility, at that time their mood, their cognitive issues, their social support, their ability to get transportation to appointments, how are they doing from a nutritional level. Are they actually getting enough food. How many people actually ask if people are eating more than two meals a day at their clinic appointment? That's not something that we usually ask them, but if you don't ask you may never know. And so screening for it is so important because then we can actually refer them to services that could help meals on wheels, for example.

So this is a really important structure that we put into the post-acute setting that can really capture all of the things that can happen to patients. And then if they're doing great they have a very simple care plan. If they're not doing so well we prioritize it to what they need most at that time. So then the APP will perform a neuro exam and screen for complications, as I mentioned.

This care plan is really kind of our shining example of all of that money that PCORI gave us can do. And we have this fantastic team that had this shared vision of how we can improve care. And so we actually mapped the community resources across North Carolina. So if you live in Forsyth County, and you need a certain set of services based on the algorithms in our care plan, then that will be printed out for you and you'll get the phone number for that particular service.

So it is highly individualized but we have this map across the state. And then as providers, different community, to figure out what community services are available. They can add it to the network so that it's in our database. And so again, we're focusing --I'll show you some examples of the care plan-- we're focusing on the four points of COMPASS here.

And this is Sarah Lycan going over the care plan with one of the patients in our clinic. And these are just an example of some of the services. So some of it may be faith based in the community. Some of it is home health activities with the YMCA. There's Silver Sneakers, although I think they changed the name now to something else, Silver something. But anyway, It's a program within the YMCA for activities. Rehab, adult day services, Area Agency on Aging is a very important resource for patients.

And this is an example of one page of the eCare plan, which is the numbers. And it's basically showing them what their blood pressure is in clinic that day, What their last LDL what level was, and then it says, these are your concerns. Why is it important because high blood pressure damages the arteries and puts you at risk for another stroke. And then how do I find my way forward.

And so we actually have materials that can teach them all about blood pressure, and salt intake, and how to take their blood pressures at home. They've got a blood pressure log and we've been really successful with getting patients to actually record their blood pressures and bring them with them to the appointment. And so this is all very important.

Then for Engage, it's all the things that are occurring at that time they're seen in clinic. Are they having weakness with their upper extremity? Are they having difficulty with mobility? Are they falling? And if they're not independent with their activity activities of daily living, then we emphasize why it's important, and how they can find their way forward. So this is all messaging that's been vetted through the caregivers, through those stakeholders, and also through the ECU Health Disparities Department. So they actually looked at the language we're using to make sure that it's culturally appropriate for everyone.

So then this services, and these are again just an example of the different things that patients may undergo at the time they're being seen in clinic, and how they can find their way forward. And then willingness. They take a lot of medicines they'll automatically get this message that they actually could get help from home health. Nursing they could get help from a pharmacist, and there are a lot of community pharmacists out there that are working with the North Carolina Community Care Network. And they actually will provide all kinds of services even coming to the home to help patients with their medications. If they forget medicines, there's a whole medication adherents tool kit that we've developed as well. And if they don't have help, then there's also services that can be provided to help them take their medicines regularly.

If they're doing great we still have default messaging that everybody gets which is manage blood pressure, be physically active, ask for help, and take the medicines correctly. So this is basically the mantra for COMPASS here. And I want to emphasize a little bit more about the Engage. We've really-- because Pam Duncan is a physical therapist and has been passionate about this, we developed an entire program called Movement Matters. And what it's designed to do is meet the patient where they are at the time they leave the hospital. So some patients are quite impaired, they may be home bound. And in that case, they may be getting home health therapy. Others are doing a little bit better and can get right into outpatient therapy. Others are doing fine and they can be referred right into a community based exercise program.

But the goal here is really self-management a physical activity and understanding how important that is for cognitive health and, for fitness, for community engagement, and for just general recovery and reintegration. And so we're also including the patients resources and preference here in this whole process. And so Movement Matters activity program is all evidence based. It prescribes therapy it trains the home health professionals and the physical therapists and occupational therapists and speech therapist that are involved with these patients.

We have an entire webinar that they can view to understand what's happening, and how best to approach these patients in a very systematic way. It matches the health service setting with the survivor function and benefit coverage that I showed you on the previous slide. And then it aligns health care quality recording measures. So we're trying to help the home health agencies meet their quality metrics as well.

And so we're very proud of the different facets of this program that we've been developing over the last year and a half. And in addition to the ability to understand how this intervention is being implemented in different hospitals, we are feeding them back quality metrics. And we've created quality metrics based on the processes that we've introduced. So we know --I showed you the data at the beginning-- we know that this call is important. It's important in order to get patients back into clinic.

And then we're going to look at the percent of patients who are actually seen and get the eCare plan, and then the percent of patients who actually get rehab. So we're talking about way beyond what we do in the acute hospital setting. We're all looking at that assessment for rehab quality measure that says nothing about whether they actually got it and how they're doing. And so what we're going to be looking at is at 30 and 60 days, the percent of patients who actually received the services that they were referred for.

So that's a lot of information. We think that this could impact a lot of different aspects of care after stroke. So obviously we think it's really great for patients and we've already gotten tremendous feedback from the field where this is being implemented. We're really hoping that this will change the way that we manage chronic disease, because stroke is a chronic disease. And we're also really excited about the possibility that impacting functional status at 90 days.

We think that this improved improves workflow and, in fact, we have anecdotal experience from the sites implementing this now that this really does improve their workflow. It's comprehensive it allows them to build for the transitional care management codes which is higher than a return visit in the hospital or in the clinic. And we think this will help health systems.

This has been a challenge with recruitment to get health systems to buy in, but the ones who have really understand that this could impact not only 30 day re-admissions and the penalties but also their ability to improve care at lower costs over this episode of 90 days after a stroke which is that bundled payment period. And it will help physicians, any physician who is involved at all with a patient in the COMPASS program will essentially meet the majority of the requirements for MACRA. And MACRA, as you know is the value based care, and it and it really focuses on engagement with the patient and the caregiver. It focuses on understanding behavioral aspects of care and lifestyle choices. And it's involving this care plan that is actually a requirement of MACRA

So this is one of the major benefits of COMPASS to health systems, and we're looking forward to understanding in the future how it affects cost as well. We can't do cost as part of PCORI mechanism, but we're going to get additional funding to look at that aspect. So in summary, we have a lot of important things that can happen to patients after they leave the hospital. And this is providing them a pathway forward for recovery. And we think that it will impact their ability to take care of themselves, to understand their stroke, to improve the movement between providers having the same health care plan, going across providers.

And we are also training them to do this, and we have all of the training materials that will allow us to scale this to, obviously, a lot of other sites when the time comes. And we'll be integrating this using health IT into the EMR. And so we actually are very close to that mechanism there. The technology exists. All we need is the venture capitalists and the commercialization in order to make that happen. So that means that we don't need an external research database in order to implement the eCARE plan. And this is one of the more exciting aspects of this is that we can actually transfer it to something that's sustainable anywhere.

So I just want to thank the Vanguard COMPASS team. And we've got a patient stakeholder here. We've got Rayetta, who's been helping us. We've got Katherine Wandell, who's our pharmacist. And we've got the Millennium Team trainers. Everybody here familiar with the Millennium Team? A few people are. These are personal trainers who work with stroke patients at YMCAs, and it's a very exciting program. Our local area Agency on Aging. And we've got our faith health expert at Wake Forest. And Robin Embry, who, I'm not sure if she's here, but she is head of the Carolina Center for Cognitive Rehabilitation, an excellent resource for patients who have finished their speech therapy and need additional help with aphasia therapy.

And so this whole team has been incredible and we're really excited about how this can help patients in our area and across the state. And so this is our website, if you'd like to look at it for more information. And with that, I'll stop and be happy to take any questions. Thanks.