Unknown: And hello, everyone. And welcome to “Using Data: An Information Systems & Partnered Research” a cyber seminar series hosted by VAIRC—the VA Information Resource Center.

Thank you to Sider (SP) for providing promotional and technical support. This series focuses on VA data use in both quality improvement and operations research partnerships. This includes query projects and partnered evaluation initiatives.

This series is held on the third Tuesday of every month at 12:00 p.m. Eastern. You can find more information about this series and other VAIRC cyber seminars on VAIRC’s website. And you can catchup on previous sessions on HSRND’s VAIRC Cyber Seminar archive.

A quick reminder for those of you just joining us, the slides are available for download. This is a screenshot of the sample email you should’ve received today before the session. In it, you will find a link to the download of the slides.

And today’s presentation is titled “Arranged Marriages Between Operations and Research: Lessons Learned from the Flow 3 Base Partnership” presented by Dr.’s Leonard, Carey and Heckman.

Dr. Chelsea Leonard is an anthropologist at the Denver site of the Seattle Denver Center of Innovation. She has a strong background in qualitative and mixed methods research and evaluation with an emphasis on collection and analysis of observational and ethnographic data.

She leads and contributes to both research and operations projects in the VA, several of which are focused on improving systems that provide care for veterans with limb loss and understanding experience of veterans with limb loss receiving care in the VA.

Dr. Evan Carey is a practicing data scientist at the U.S. Department of Veteran Health Affairs, a health outcomes researcher, and a quantitative collector of the VA Collaboration Evaluation Center. Evan’s research and operational data science experience has focused on his long lasting partnerships within the VA.

He has led numerous organizational improvement analyses for the VA including partnerships with the Office of Rural Health, the National Pain Management Program, the Office of Specialty Care Transformation and the Office of Practice Management and Access in the National Surveillance Team.

Dr. Jeffrey Heckman serves as the Medical Director of the Regional Amputation Center—Tampa within the VHA Amputation System of Care at the James A. Haley Veterans Hospital and Clinic, and is an Associate Professor of Rehabilitation Medicine at the University of South Florida—Morsani College of Medicine.

Dr. Heckman has extensive experience in clinical care, leadership, education research and innovation, and led the development of the Flow 3 system for prosthetic limb care at the VHA.

Dr. Heckman has been awarded the Implementing Faculty Fellowship for his gold star practice from the VHA Diffusion of Excellence. Thank you all so much for joining us today.

Dr. Jeffrey Heckman: Thank you very much. What a wonderful introduction and we really need to first of all, thank the Rehabilitation & Prosthetic Services at VA Central Office in Query for arranging this marriage and all the information that we’re going to hear as we move on today discussing our experience and our lessons learned.

(Background chatter)

First, before we get into that, I was wondering if you guys would all provide for us your role in research and/or quality improvement projects. So, our first poll is, “What is your role? Knowing our audience here.”

So, you should see the poll question over there on the right-hand side on your screen. And if you can just give us some information about your role about research and/or quality improvement projects.

Dr. Chelsea Leonard: Great, thank you. So, the poll is open and your choices are a) Investigator/PI/ OI (SP) b) statistician, data manager, analyst for programmers c) project coordinator and d) other.

And please describe in the Q & A function. Our answers are coming in. I think we’ve slowed down quite a bit. So, I’m just going to go ahead and close that poll and share the results.

We had 7% said a) Investigator/PI/OI 2% said b) statistician/data manager 17% said c) project coordinator and 14% said other. And those are HSR fellow and tumor registry.

Dr. Jeffrey Heckman: All right, well, it’s exciting to see a mixed bag there. I think this’ll be really interesting from multiple perspectives. So, exciting to see that we have a mixed audience out there.

And then, second, we all take great pride in what we do here working with our veterans. So, let’s hear from the audience. How many years of experience working with VA data?

So, if you have none, that’s a. B) is one year or less. C) is more than one year less than three. D) is at least three—less than seven. E) is at least seven, but less than 10. And F) is 10 or more.

So, then how many years of experience working with VA data do you have?

Dr. Chelsea Leonard: Great, thank you. So, our answers are slowing down. So, please remember to hit that submit button right after you select your choice. That’s the only way your answers are going to be recorded.

All right, it’s slowed down. So, I’m going to go ahead and close that and share the results. You have 2% that said a) none 12% said b) one or less 14% said c) more than one, less than three 14% said d) at least three, less than seven 4% said e) at least seven, less than 10 and 8% said 10 years or more.

Dr. Jeffrey Heckman: Wow! This is great! Well, I think the combination of VA experience and VA data experience really across the board as well as a mix audience, I think this is going to be a lot of fun. Hopefully everybody can really take something away from today’s discussion about this lifelong partnership that we have created here—this arranged marriage between our innovation and research partners here at VA.

So, this is going to be our session road map. We’re going to take you through an introduction to Flow 3. We’re going to meet Flow 3. We’re going to talk a little bit about the arranged marriage, about bringing these partners together. And then, ow as a partnership we really establish this with the end in mind that we recognize the outcome that we wanted and then work together to achieve that outcome together.

And although that is the plan, we all know that the best laid plans don’t’ always work out. So, as we can see kind of moving here from Indianapolis to Columbus, we might have to take a little detour, and check out Dayton, and go to Miami, or Ohio, or do something on the way as we’re passing through.

And we’re going to talk about all of those lessons that we’ve learned over the past few years since this marriage was arranged and brought us all here together today.

So, here it is. Let’s meet Flow 3. This is the new process for prosthetic limb care at VA. This started all the way back in 2013. And I joined the VA as the Medical Director of the Regional Amputation Center in Seattle. And really, came out there asking questions.

And as a new leader, I really wanted to learn the system and really demonstrate that sensitivity to operations. I feel like the higher liability organization that we’re creating here at VA really encourages understanding and having that sensitivity to operations.

So, when I asked the question about prosthetic limb care, we’re able to find this flow chart and understand that each prosthetic limb is prescribed. It goes through a specification process and is then ordered, is then fabricated, and delivered, and ultimately verified by clinic.

And when I discussed this with my team, they really felt like we had some gaps. And so, the next thing that we did is really deferred to expertise. So, we used another one of our HRO strategies in demonstrating deference to expertise. And we developed a team of frontline staff members from each of these places along the process in order to utilize their expertise for the end that we had in mind which was developing this strong outcome, this consistent and efficient process with high accuracy and high reliability for veterans with limb loss who are being prescribed prosthetic limbs at VA.

And so, the way that we got there, you know, we started as I said, all the way back in January of 2013. We utilized internal reviews as well as external reviews with our MAACO (SP) colleagues. We presented on this pilot that we had developed and we joined. And we collaborated.

We had multiple partnerships. We had multiple opportunities to bring people together in order to understand how to get to our outcome with that end in mind. And we were really placed or put in a place to succeed.

So, we had the infrastructure around us. We had the electronic medical record which was in place already. We had those experts. We had the people to understand the data, and understand the process, and bring those two things together. And we utilized the technology around us in order to achieve this.

And then, as you heard in my introduction, I was fortunate enough to receive the Implementing Facility Fellowship through the VHA Diffusion of Excellence with the Shark Tank Competition.

And then, we were able to pilot this process and we got to a point in September of 2017 where I could see that based on the success that we had achieved, we were going to this national approach. We were working towards an enterprise-wide initiative.

I remember meeting with Dr. Beck at the Shark Tank Competition and saying, you know, that this is going to be the answer. This is going to be the solution that we have at that enterprise-wide level. And what I didn’t realize at the time was we really needed that partnership and evaluation in order to insure that we were following things like this public law that came out in 2019 for the Foundations for Evidence Based Policy Making Act in order to insure that each new federal program had an evaluation strategy embedded within it.

So, it was really that conversation with Dr. Beck and then Dr. Beck’s vision to get together with Dr. Amy Kilburn (SP) from Query in order to arrange this marriage and this partnership that has been so successful. And I’m so very proud to discuss what we’ve been doing over the past few years, the results that we’re seeing and then the lessons that we’ve learned from that process.

So, I’m very excited and pleased to introduce you to Dr. Chelsea Leonard who will tell you a little bit about our initial project planning and the rein (SP) in process.

Dr. Chelsea Leonard: Thank you. I’ll start by saying that in the honeymoon phase of the arranged marriage, we had a really good time. We started by planning an evaluation that we thought would highlight both the impacts of Flow 3 and also monitor implementation efforts of the program scaled up across the VA.

In this early stage, Dr. Heckman and his colleagues were very enthusiastic, and they were very willing to share information with us, and to walk us through everything that they had developed, and implemented, and exactly how they did it. And I really can’t stress how valuable that was to us as evaluators.

In addition, they had already done a really good job looking at local impacts of Flow 3 as they developed it in their own vision. And this helped us to understand some of the things that they really wanted to know as we planned the evaluation.

I won’t walk through everything that we thought was important to evaluate. But some of the most important outcomes that we came up with were how Flow 3 impacts the timeliness of the limb provision process, user feedback on the training, and implementation, and impacts of Flow 3. And then, veteran satisfaction was the process of receiving a limb from the VA.

And we used the renamed framework to guide this planning. In the planning stage, we learned that Flow 3 would be implemented across the VA in waves. And the first two waves were planned to coincide with the two years of funding for this evaluation.

We thought that was really lucky. And so, we planned an iterative evaluation where in the first wave we would collect information that would then inform implementation efforts in the next wave.

Of course, nothing ever really goes as planned in an evaluation. And by the time our proposal was funded, the implementation timelines had changed a lot. These plans continued to change throughout the evaluation.

And so, we’ve had to go back to the drawing board, and adapt our timelines, and priorities in order to keep up with rollout. From our initial plan to evaluate the implementation and impacts of two waves of Flow 3, we’ve pivoted to evaluate the enterprise-wide implementation and impacts of Flow 3.

Thankfully, we’ve had a close partnership with Dr. Heckman and his colleagues. And this has allowed for frequent check-ins. So, we’re able to continually revisit priorities and make sure that the evaluation team is collecting data that’s both informative and actionable.

In addition, when we planned this evaluation we knew that Flow 3 would eventually go enterprise-wide. We just didn’t know how quickly it would go enterprise-wide. Knowing that the end goal was to successful implement on a large scale to benefit as many veterans as possible has really allowed us to create systems to monitor how Flow 3 is adopted, implemented, and sustained.

In the next few slides, Dr. Carey will provide examples of how our partnership has led to a better understanding of data availability, and analytic needs, and how this has allowed us to successfully shift our focus over time.

And so, I’ll hand it over to Dr. Carey.

Dr. Evan Carey: Thank you so much. So, I wanted to start by saying, gosh. We really appreciate Query’s support here. And in particular, Dr. Kilburn’s support and vision in kind of funding these research and operation partnerships and managing us up has been fantastic.

So, I want to talk about from the quantitative evaluation perspective and from sort of a data understanding perspective. Where we started out, and how we evolved our understanding of the data, and what high value products would look like, and where we ended up.

And so, just kind of frankly talking through this, I think we didn’t start out in the highest value space. We ended up in a better place.

So, we’ll start with sort of the best laid plans. At the outset of this project, you know, I didn’t know much about the provision of limbs in the VA. My expertise is in more quantitative evaluation data science.

And so, we sort of tried to understand, “Okay. Let’s figure out this process. Let’s think about where the points of measurement could occur in this process in the provision of limbs to veterans.” And then, we can start to do this sort of evaluation we might think of which would be, “Okay. A Flow 3 comes online at a new site. How has the process been improved?”

And we really focused on access and timeliness initially. I should say access is measured by timeliness.

So, we think about these sort of counterfactual analyses where you say, “If Flow 3 had never come to that site, what would their timeliness have looked like?” Oh, but then Flow 3 did come to that site. And there’s sort of a difference and we kind of want to measure those average differences.

So, we’re thinking about a pre/post analysis initially. And then, we’re looking at this process and we’re actually quite data limited. So, all the data elements we’re going to talk about are not available in the sort of standardized CDW AO1.

They’re all in CDW RAW. So, they’re kind of not subject to the business rules and really easy to use. But thankfully, we had a data expert on the operations side—Jeff Bott (SP)—who has been great and really helping us out with understanding all that.

So, initially we realized, “Okay. We can measure part of this process from prescription to purchase order. Which should be related to the timeliness of the entire process. It sort of holds up in our conceptual framework that maybe Flow 3 would impact the overall timeliness in that portion as well as an entire thing.

And of course, we have the ability to kind of construct these national data sets, poll data over a bunch of years, and then identify any pre/post differences.

So, that was our initial plan. That was the space we started out with. And if we look at that, we start thinking about, “Okay. Well, Flow 3 happened at certain sites on certain days.” There’s multiple dates of interest.

There’s sort of a pre-controlled date. Nothing’s happened yet. And then, there’s a post training date where we sort of think about measuring the effect. And we’ve got those all summarized. And it occurred in different phases.

And then, we’re continuing down this path of sort of a pre/post analysis. And we did some models, but this is sort of a summary of just the descriptive statistics. We’re seeing some pretty good signals that it seems like in Phase I and Phase III there was a large shift in time on this. And that data we can access both in the 80th or the 75th percentile.

And then, in Phase II, there was less of an effect—maybe no effect of the pre/post. And that seemed to resonate with Dr. Heckman’s experience in some of those rollouts.

But I guess I want to point out here, you know, often we really study the mean sort of by default because there’s a bunch of convenient statistical methods for setting the mean. And it’s always interesting for me to think about, “Is that really the thing of interest that I want to study?”

And if not, we should think about, you know, median or percentile, quantile analyses. So, that’s something we did in this project.

So, continuing on now, we’re starting to think about, “Okay. Well, how could we estimate this? And, you know, when you really look at these graphs though, there’s some odd outlives, right? So, keep in mind our goal is to estimate this pre/post exposure difference for this counterfactual and observational data, right?

This isn’t randomized. And we see some weird outliers like well over 400 days, well over 200 or 300 days. So, we’re starting to question some of the data fidelity here that we need to do some data cleaning.

And then, we’re thinking about kind of traditional models that we might use here. So, interrupted time series. Limited assumptions there. Comparative interrupted time series or difference in difference estimators depending on what assumption to uphold and doing some sort of pre/post difference.

And so, we’ve started to iterate with Jeff Bott thinking about our data quality. “Are these plausible data points? How do we clean these up?”

But then, you know, we really had to think, “Stop. Wait a minute. Am I really doing high value work?” And what I really want to encourage everybody listening is if, you know, if you’re a quantitative scientist or you’re sort of even an analyst fresh out of school on your first job, frequently when you’re doing your work stop, lift your head up out of the code/out of the results and just think, “You know, at a big picture, what am I estimating and is it high value? Is it still high value?”

You know, I usually thought it was at some point or I wouldn’t be doing it. But our understanding and our, you know, sort of our priors change as we gain more experience.

And so, in this case, when I really looked at it I thought, you know, “We have a questionable fidelity data signal that we’re still trying to resolve.” And although we had focused on flow 3 changing access as measured by timeliness, if you think back to Dr. Heckman’s introduction to this material, you know, starting with the act of Congress that motivated this.

It wasn’t I don’t think that limb provision was terrible in the VA. And it was just taking lots of time everywhere and access was really bad. I think it was more that there was some one off reports of poor service in different VA facilities.

And when we went to really look into it as a system, we weren’t able to measure and say how we’re doing nationally. So, to me, the genesis of Flow 3 was partially, yeah. There may be some sites that really need some standardization of processes and it will improve their timeliness.

But what we really need is a method for understanding what limb provision looks like nationally, so that we can track it. And when Congress sends us inquiries and says, you know, “Hey, this veteran called my office and, you know, said it’s taking a really long time to provide a limb” what does that look like? Is this a systemic problem?

And we couldn’t do that prior to Flow 3. So, then if I think back to the results I just showed you and said, “Is estimating a portion of that timeliness process, high value for understanding how Flow 3 is going?” I think maybe it’s not.

So, we started to pivot at that. We said, “Okay. Maybe we should do some other work.” So, we didn’t completely throw this away. But we said, “We’re going to work on the data fidelity signal. We’re going to kind of contextualize this to say, ‘Pre/post flow 3. There’s a part of the process. There may be some good differences’.”

But the things we’re really interested in measuring, they’re really measured by Flow 3. So, Flow 3 is this like informatic system that gets installed. And now all the sudden, we have visibility to the entire process—who’s using what, when they’re using it. “When do all these actions occur?” “Are they documenting them?” “When do all the limbs get delivered?” “What’s the final checkout look like?”

And the reality is prior to the existence of Flow 3 we just didn’t have that data. So, of course you can’t really do like a pre/post analysis on data you don’t have.

So, we do continue that work I just showed. But we shifted our focus to then talk to our operational partner and say, you know, “What’s the highest value work we can do to really measure the impact of Flow 3?”

And so, this really led us to think about more of an implementation science approach. So yes, we hope it’s effective, right?

We measure effectiveness. And effectiveness in one sense might be reduction in the time taken to go through this whole process. But that’s really a distal outcome.

We think about what Flow 3 looks like. Dr. Heckman is rolling this program out, installing it. Hopefully people find it easy to use. They engage. They start using at all these sites. And then, they have the ability to monitor and see what’s going on at their own site.

So, really timeliness is this downstream outcome. So, what’s the upstream outcome? Maybe the thing that’s more proximal to the process.

Well, it’s really these adoption implementation metrics. So, this is where I think we got very creative in this partnership. And this dialogue back and forth ended up in some really high value work.

So, we started thinking about, “Okay. Well, how do we know who’s using Flow 3 and where they’re using it?” And if some site is only partially using it, why is that, you know. Are they stuck on some component? Is there a clear signal that if they just change one or two things they could get to sort of full use of it? Full implementation we might say?

And so, we went back and forth with Dr. Heckman and defined sort of full adoption, partial adoption, and then no adoption. Although at this point we’ve actually updated that syntax. We think of that as implementation rather than adoption. And we started to design these dashboards. This was late last year.

So, we wrote a bunch of our code. We hooked up to the sequel databases. Jeff Bott provided some DOA excuse to the raw data. We got it cleaned up and we said, “Okay. What does Flow 3 utilization look like?”

And we built these metrics and these reports for Dr. Heckman so he could understand at every site how they’re doing, how much they’re using it. And if they kind of fall off and stop using it, what part of the adoption process is that fall off occurring?

So, these are just some screenshots from some of those reports. And we did all of this using R and markdown, so that we could basically regenerate these in near real time, you know. As soon as the data’s updated we could run it generating a new set of reports. Dr. Heckman could access it.

But there’s still static, right? These are still essentially PDF’s or maybe HTML’s with like table of contents, but static reports.

But it did enable us to do this sort of near real-time monitoring of again, we should probably say implementation. And if we look at all of these, we can see for different sites, different visions, sort of different phases. We’re having different trends and implementation across time.

And we might have like a large initial implementation and then it falls off. And so, that’s what we ended up measuring.

So, from there Dr. Heckman said, “Well, gosh, you know. I’m now having to reach out to all these sites and tell the site, ‘Hey, you know, it looks like you started off doing well. But you seem to have fallen off in these parts of using Flow 3 and I think that’s because this part of the process isn’t getting documented. So, if you were to just change that, you know, you would have more of a full implementation of Flow’.”

And so, to facilitate that we generated some kind of like smart techs reports again, using R. You might recognize this sort of a Word document that comes into R markdown if you’re into that sort of thing.

And we would start to generate for every single site a report of how their implementation is going. And this is an example of that.

So, essentially we’ve got this all set up in loops. And then, it’s like hooked up to these DOEX views. And so, we’ve got some sequel code that puts it in the right format. And then, we can just run it, right?

So, we can sort of do these updates. But again, these are static, right?

We’ve got to click a button, run the loops, generate the reports. And then, they end up in a folder that Dr. Heckman could open, send to sites, and so forth.

So, some more examples of that. Basically just some graphics that we thought were informative in terms of what sort of adoption is occurring. And I should note at this point we’ve worked with Dr. Heckman a lot and we’re thinking, “Okay. These are what we think a site might like to look at.” Based on Dr. Heckman’s perspective, based a little bit on ours. But of course, we’re not at all the contextual experts here.

And so, we generated all these site reports. But those are static, right?

As we noted. So, I’m writing our code. Actually, Peter Chen—I don’t think he’s with us today. But he’s the in all who wrote all our code I should say. Thank you for doing all that work.

And we’re generating them, but it does require us to run these generating reports. So, of course, a dashboard would be better.

So, this is where I think this work kind of went to the next level where a power BI implementation dashboard was developed. And so, we worked on sort of the architect and design of that as based largely on the reports we were generating using ours.

But Jeff Bott—who’s a informatician who’s been working on the operations side—actually implemented this power BI and built the whole thing. So, we went back and forth with them on some design phases to say, you know, “What does it mean to define adoption?”

Again, now we say implementation. That’s probably a better word to use at this stage. And get this power BI online.

So, this is sort of our current state. We have an implementation dashboard that’s aimed at Dr. Heckman where he can easily see all of the sites, what’s going on, if they’re kind of hung up anywhere, sort of what their trends are over time.

And then, what we’re finding now really in just the last two months is that this is a great product designed for Dr. Heckman. But it’s actually very rich in data which is a little bit of a barrier to sites that might not be as into the data, or, you know, overwhelmed by that level of detail, or just simply not have the bandwidth to look at another dashboard with a lot in it.

So, our current stage we’re thinking about is if we talk to some of our users—and we’re getting some feedback from sites where they look at it and they say, “Okay. I see I’m getting a low percentage/a bad grade. But I don’t know what to do with that. I don’t know how to fix it and I’m now being told I have to fix it. So, how do I fix it?”

We’re going to redesign your dashboard a bit. And we’re going to do some user-centered design approaches to understand from their perspective, you know. Like what is actually the minimal amount of information we can communicate to a user, right? A site leader who’s sort of monitoring their implementation of Flow 3, so that they can understand how things are going and rapidly understand, and how to adjust, and fix any issues that have been uncovered.

So, that work is ongoing. And that’s kind of where we’ve ended up in this second year of funding. We are continuing to do that effectiveness on the timeliness piece. But I think it’s really taking a bit of a backseat in importance to disrupt the underlying data fidelity and really just the conceptual framework that the thing we really want to measure is how effective rate has Flow 3 to implement it.

And then, the timeliness should be a good side effect. But, you know, if a site was doing well, if the site had a stable process prior to Flow 3, there’s no reason to expect Flow 3 to give better timeliness. It would just get better visibility and standardization into the process.

All right, so I think I’m going to pass this back to Chelsea now.

Unknown: (Background chatter)

Dr. Leonard, you have the floor. You are next.

Dr. Chelsea Leonard: Sorry about that, everyone. I was on mute.

So, the dashboard that Evan has just showed you all has really been a fantastic tool because it’s allowed us to see pretty much in real time what is happening at different sites. And this can help identify instances where Dr. Heckman and his colleagues might want to intervene and provide extra support. And it can also help identify sites that are doing really well.

And so, we might want to understand what is happening at those sites. I think that as an evaluation team, our team is sometimes able to collect information that sites might be hesitate to share especially sites that are struggling with Dr. Heckman and his colleagues.

And so, we’ve been conducting qualitative interviews to understand how people are using Flow 3. And these interviews have helped identify the reasons that not all intended users are actually utilizing it at every site.

So, most of the feedback that we’ve received from users is very positive. But some participants have told us that they or their colleagues are reluctant to use Flow 3.

Some of them tell us that people are simply resistant to change. Some of them tell us that they or their colleagues are uncomfortable doing new things on the computer. And some people have talked about instances where IT has actually been a barrier to getting Flow 3 installed on their computer at some sites.

In addition, we’ve heard several times from physicians and prosthesis that some roles like purchasing and contracting agents might be reluctant to use Flow 3. People who have told us this explained that those roles sometimes have high turnover at different sites which makes it difficult to insure adoption.

Some participants have also suggested that having a site champion could help promote Flow 3. And I will point out that there actually are champions identified at every site. But participants also state that everybody is very busy, so it’s difficult to be an effective site champion.

Finally, we also talked to a few people who were unclear about whether or not they were required to use Flow 3. And these people felt that a top-down mandate would really help to improve adoption.

I wanted to share a couple of quotes to support my statement on the previous slide about not all roles adopting Flow 3. The first is from a prosthetist stating that purchasing agents are less likely to use Flow 3 at at least one site.

And the second is from a purchasing agent who describes Flow 3 as just another hurdle that does not directly help purchasing agents in their job. Some purchasing agents told us that Flow 3 sometimes required work duplication which they found frustrating because Flow 3 doesn’t directly connect with their purchasing system.

I’d like to point out that we actually have trouble recruiting purchasing agents for interviews. So, the feedback that we received may not be representative.

I know that Dr. Heckman has heard from several purchasing agents that Flow 3 actually improves their process. So, this is an area that we’re continuing to explore.

I also don’t want to throw one user type under the bus. We definitely have examples of others who are slow to adopt Flow 3 and this is just one example. It is interesting though that the qualitative data that we’ve collected here supports some of what we’ve seen in the dashboard over time.

Now I will shift focus a little bit and talk about that the data we’re collecting on how Flow 3 impacts frontline users and veterans. The primary focus of our qualitative interviews with providers and staff has been user satisfaction. We want to know if users are happy with the training that they received, if they’re happy with implementation, if they feel that they have the support they need to continue to use Flow 3, and also how they feel using Flow 3 impacts their workflow and veteran care.

We tried to talk to all potential user types. And our participants included prosthetists, physicians, purchasing agents, prosthetic chiefs, and prosthetic representatives. We were unable to recruit any schedulers for these interviews.

To date, we’ve conducted interviews with 53 people on user satisfaction and we’re continuing to talk to people in the most recent implementation cohorts. Most of the feedback that we’ve received has been very positive. Participants feel that Flow 3 enables them to track limbs in the fabrication process which is extremely helpful when they’re talking with patients.

They’ve provided examples of being able to look up limbs when a veteran asks to call them about progress or to have documentation of the process and care while other team members were out of the office. Many participants felt that improved documentation prevented patients from falling through the cracks.

And several people we talked to said that improved documentation was the single best thing about Flow 3. One person actually called Flow 3 the greatest innovation that has happened in the VA in the last several years.

So, that was pretty cool to hear and I think it reflects what Evan was talking about. Just that before Flow 3, people really couldn’t see what was happening in the case of an individual veteran if that was necessary.

Participants also feel that the limb procurement process in that Flow 3 is very user friendly. Some people have described that Flow 3 improved communication within their teams and also communication with vendors outside of the VA which is seen as a huge benefit.

When we asked about training and support, most of the people we talked to felt that the support that they received from Dr. Heckman and his colleagues was invaluable. They have been able to reach out via chat, email, or telephone for help problem-solving. And I think many of them have taken advantage of this quite often from what I know about the amount of time that Dr. Heckman and his colleagues have spent helping folks.

So, this support has been really appreciated. Almost everybody that we talked to also said that the training for Flow 3 was good. But most of them wanted to be trained in person. They felt that an in-person training would be more engaging and more efficient.

This feedback was taken into account in Vision 9 were site champions were able to attend an in-person training which had really great reviews. However, due to the cost of nationwide expansion and the inability to travel during Covid-19, training for all of the successive cohorts has been virtual.

And finally, one of the primary goals for the remainder of the evaluation is to understand veterans perspectives of the limb acquisition process. Veterans might not know that Flow 3 is now implemented enterprise-wide and that they’re their limbs are being ordered in a different manner than they were previously.

But we still want to ensure that veterans are receiving the best care possible and that they’re happy with that care. And part of making sure that they are receiving the best care possible is that ensuring that they understand the process of receiving a limb, that they receive communication about that process, and that they receive their limb in an amount of time that they find acceptable.

We’re conducting interactive voice response telephone surveys to collect veteran feedback at the moment. And this effort has really required post-collaboration between the implementation and evaluation team because we’re trying to insure that we call people who have recently received a limb just in order to collect useful feedback.

This part of the evaluation is still in progress. So, I’m not able to share any data today. But I think we will be able to share some data relatively soon. And this data collection effort—the interactive voice response in addition to everything else that we’ve talked about—really wouldn’t have been possible without the partnered evaluation.

We’re really excited to see the results of these veteran surveys because we think it’s so important to be able to provide all of the sites that have Flow 3 as well as leadership with a more complete picture of how Flow 3 impacts veteran care.

We would like to wrap up our presentation by sharing our different perspective on why this partnered evaluation has been successful and also some of the challenges that we’ve faced.

From my perspective, I think the fact that everybody has been very engaged in making this successful has been important. We’ve had very consistent communication, open sharing of information, frequent check-ins and this has helped us understand on the evaluation side the plans for rollout and what the evaluation needs really were.

And it’s also allowed us to pivot when necessary. Personally, it’s also been really nice to work with a team who’s so enthusiastic and excited about what they’re doing. This was the first time that I’ve been part of a project like this and it’s been a lot of fun. And I’ll pass it over to Dr. Heckman.

Dr. Jeffrey Heckman: Well, fun. I mean, that’s why we do all this stuff, right?

So, I think for me, I agree. I think the enjoyment, the ability to really you know, very early on identify with Chelsea and with Evan. Their expertise and their enthusiasm about really having it a successful product and making sure that we were going to get there.

I think all of the calls and all of the meetings that we came together on were really enjoyable. And I really identified each of them as extremely productive meetings. And so, I think that the leadership that Dr. Leonard and Dr. Carey had demonstrated throughout this arranged marriage—this wonderful partnership that we had—has really been phenomenal. And they committed to it.

I think the commitment to this partnership was key. The commitment from my team, from Wayne Biggs who’s the direct prosthetist in Seattle, from Jeff Bott who’s the Program Manager at VAICO with the orthotics and prosthetics clinical services. They really kind of bought into this.

And I think the willingness to accept that we are very proud of what we have built. But we identify that there is more expertise out there to evaluate this whole process and really help us to get to where we need it to be. I think that was very humbling. It’s really, you know, showed in droves with the results that we’ve all seen today and that we expect to continue to find from the veteran feedback that we’re going to receive from the VIVR.

So, I think I can speak for my whole team, for Brian Stephenson (SP), for Carl McCoy, for Jeff Bott, for Wayne Biggs. We have really enjoyed this partnership and look forward to continuing to work with this group.

But Evan, tell us why you feel this partnership is so successful?

Dr. Evan Carey: Sorry, struggling to find the mute button.

Dr. Jeffrey Heckman: There you go.

Dr. Evan Carey: Yeah. So, I mean, why is our partnership successful?

I think first and foremost is we rapidly developed a good team energy. And I think the key components of that are just a belief that we all have good intentions for the project and for each other. And that any feedback we give and any work we’re doing, you know, is like never personal. Like I’ve never once had an occasion to doubt any person who’s been working on this.

And I think that’s really worth saying because sometimes with these sort of arranged marriages, you’re working with people you don’t know, you know. And I sometimes take it for granted that I primarily work with people that I’ve worked with for 5-10 years, and built trust with, and know, and you know, spent time with, and had meals with, and just never doubt their good intentions. And it’s easy to have a good culture.

And so, I think a big part of this ramp-up was establishing that straightaway. And then, you know, other things I’ve been a part of that has had varying degrees of challenge. And I mean, it’s always an important thing to work on even if it’s challenging to work on it at first. But it was really easy with Dr. Heckman’s team.

I think the other thing is really want to shoutout to Jeff Bott again. We ended up using very non-standard, sort of non-nationally standardized is what I really mean data of omittance. And Jeff Bott has a very deep understanding of those and has been very generous with his time, you know, and expertise as we’ve talked through that.

I mean, we’ve like corrected each other’s code and all sorts of things. So, I think those are some of those key ingredients and just being open to being self-critical of our work in sort of the name of continuous improvement. And again, never felt any ill will as we kind of went through that process.

So, I think that’s the thing that I would point out is the most successful ingredient. Dr. Leonard? Did you want to comment or—

Dr. Chelsea Leonard: No, I think I agree with everything that you’ve said. We’ve had a wonderful team and everybody who’s working with us has just been so engaged. Also, the qualitative team, our Project Manager, Ariel Holstein, everybody’s been fantastic. So, it’s been a lot of fun.

And I guess it seems a little negative to end with challenges. But I don’t know, Evan, if you wanted to say a little bit about some of the challenges that we encountered as well?

Dr. Evan Carey: Yeah. And, you know, maybe I think we really framed these. I think that graphic’s great because the focus point at the end of overcoming those challenges. And I think of these really as more opportunities to improve our work. And I think that’s just a good way to live your life and a good way to live your research life too is that you have these challenges. And these are opportunities to improve and critically think about the work I’m doing.

And so, I think one of them, you know, we had some data challenges that we’ve overcome. And, you know, maybe some still persist today, and just sort of working through those as a team, and understanding, you know, the fidelity of the data, and increasing it as much as we possibly can.

I think on the dashboard side, I personally have not had a significant experience building and designing dashboards, right?

So, that’s a personal challenge for me that I have really enjoyed starting to overcome. And again, Jeff Bott’s been so generous with his expertise and time there. But I think our team is learning a lot more about effective dashboarding practices in the VA and that that can be a really good solution compared to some of the prior work.

I mean, I guess maybe five years ago there’d have been a variable bit of our coding and sort of automatic report generation on national data sets which was kind of cool and novel. But I do think with the way power BI’s implemented in the VA now, there’s a great opportunity for us that we’re taking advantage of to sort of merge those practices with the more national software architecture that’s available.

What do you say Dr. Leonard or Dr. Heckman? What about challenges from your perspective?

Dr. Jeffrey Heckman: Well, I agree. I think the image here is great and I think about it as the opportunity to improve. And so, I know operationally we’ve run into challenges all along the way. I think working together as a team, having strong leadership as I mentioned with Dr. Beck and Dr. Chandler on just always having that support, and knowing that we’re all moving together forward.

And the center of this all revolves around that initial problem, that initial slide where we have a veteran with limb loss that requires care. And we’re able to provide them this care now in a standardized way that is accurate and transparent across our enterprise. And it’s something that we should all really be proud of.

And so, I’m really encouraged about the future. I’m really encouraged about our opportunities to continue to improve the care that we provide to our veterans with limb loss. And really appreciate the cyber seminar today giving us the opportunity to share our story, to share some of these lessons learned.

I’m really hopeful that those in the audience will take some of these lessons learned and apply them directly to the work that they’re doing specifically some of those areas related to the higher reliability organization as we think about our sensitivity to operations, and difference to expertise, and really, you know, reaping the rewards of continuing to move forward together.

So, thanks everybody.

Do we have time for questions?

Unknown: Absolutely! The first question is, “It’s so valuable to hear about your perspective on this. Is there anywhere we can access the facilitators, and challenges of your partnership, and how you overcame these, so that we can apply them to our work?”

Dr. Jeffrey Heckman: Well, we’re all VA staff which I think we all take great pride in. So, certainly we all have VA emails. We’re all on teams. The Flow3@va.gov is the email address that we use for our primary team, for the Flow3 team—Wayne Biggs, Jeff Bott, Carl McCoy, and I.

So, certainly we’re always open. And I think just, you know, the willingness and I’d like to thank my co-presenters here at Chelsea and Evan for their willingness to come on this national forum, and talk about these lessons learned, and talk about some of the challenges, and how we had to change our plan, and iterate a bit, and continue to work together in order to achieve these successes, and just being able to share that with folks, and allow them to understand, you know, what we’ve been through together following this arranged marriage.

Unknown: Great. And can you talk about the process of designing the dashboard and how you made decisions about what would be useful to show?

Dr. Evan Carey: This is Evan Carey. Yeah, I think initially when we were designing it, a lot of that design work occurred in the sort of static document generation of those kind of near real time reports we were doing with like our end sequel, right?

So, it wasn’t actually the dashboard yet. But There was I guess a lot of active communication back and forth when we just started to think about, okay. What are the important data signals from your perspective, Dr. Heckman about how a site’s doing? Like what does it mean for a site to have fully implemented Flow 3? And how might we observe that in the data?

And so, we started sort of defining all those computational phenotypes—those indicators. And then, from there had really good conversations with Jeff Bott about, “Okay. Well, if we want to measure that, how do we actually do that using the Flow 3 data outputs that are again on CDW-ROM on the RAW servers?”

And then, iterating back and forth with the graphical presentation of those to say, “Okay. Do those trends make sense? Is this really telling us what we thought it would tell us?”

And I think I wouldn’t describe it as ad hoc, but I am coming to appreciate that the science of user-centered design is something that I am under trained and not, you know, under skilled in. And that’s something I’ve been working on for some of my work that, you know, there’s people who thought long and hard about, “What’s the most effective way to design a dashboard and gauge user input, you know, define features and get down to that minimal feature?”

But yeah, initially it was really more of that less scientific approach of just iterating with Dr. Heckman and Jeff Bott. And then, I think once we have that all laid out in sort of static formats, it was more straightforward for Jeff Bott to say, “Okay. These are sensical constructs for defining implementation in the different sub portions of implementation.” Subdomains I should say.

And then, he really just operationalized them into the dashboard. Dr. Heckman, would you have anything to add on that?

Dr. Jeffrey Heckman: Nah, I think that was great. I think that, you know, it’s that continuous improvement, that continued iteration on, you know, now that we’re getting a lot of feedback and a lot of requests for the information about the implementation dashboard, and continuing to work towards personalizing that, and identifying exactly how, you know, folks want this to look for them. And we’ll allow them to understand that in the least amount of time to be able to develop a plan is really where we’re going with this.

So, I think it’s really been great work to kind of learn alongside and understand how we can provide this information to leaders to then manage their people.

Dr. Evan Carey: And I might add one thing. We’ve had some recently about I guess I’ve been working in Informatics in the VA for a long time and I think it is a very VA thing to do to come up with a way to measure a new process, turn that into a performance metric, you know, that sort of looks like a grade, expose that to sites and say, “Hey man, this is how you’re doing”. And it’s good or it’s not good and fix it, right?

And whether we’re talking about wait times or a variety of other metrics, you know, some of our sale metrics or other things. I think as an organization what this really reflects we always have to think about is it makes a lot of sense to design performance metrics to measure processes, so we can understand how things are going. And we’ve done that here with this dashboard.

And what we really need to do as our next step then is to say, “Hey, not only is there a performance metric that, you know, may tell you how you’re doing, but far more importantly is there’s this tool that tells you how to make that better”, right?

So, not so much “Here’s your grade”, but more like “Here’s your competencies.” “Here’s your subdomains of your grade. And then, if you just do these three things it’s going to get a lot better.”, right?

So, that’s something that I’ve sort of reflected on both in this project and even the broader sense of the work I do in the VA always trying to expose sites to that information as much as the actual key performance indicator.

Unknown: Great. Next question—for the IVR analyses, how are you finding veterans to call and how are you monitoring the process?

Dr. Evan Carey: That’s a great question. So, essentially we have a sequel code and we’re catching all the consults—everything back to that slide where we were looking at the process. As soon as the upfront bit occurs, we really have visibility into all those steps and the kind of using the Flow 3 data.

And so, we basically just run a, you know, I think we probably run it probably once a week. I’ll set a sequel code to identify which veterans we think have possibly received a limb or if they haven’t, you know, its’ kind of overdue. I’m interested in surveying them anyways.

We identify that every week. We populate a database to sort of understand who are all the veterans we might be interested in calling. We have some rules set up about how often we should call veterans. And if they don’t answer, how long we should wait before we call them back.

And then, sort of track the responses and once they respond at the IVR system we sort of delete them out of the at risk list unless they get another limb in like six months down the road. So, basically we have a code base tracking all of that like \_\_\_\_\_[00:52:45] and IVR server in.

Call the veterans that are eligible sort of throughout the week. And then, we’ve actually designed some reporting to sort of monitor how that’s going. So, if that machine ever breaks down or, you know, like runs out of gas it’s like overheats, that sort of thing that we have visibility and we have it pretty rapidly, so that we can fix it.

And I will say that’s been really important because that has happened a couple of times where one of the data streams goes down, you know, or one of the data streams is not getting enough data for some reason. Like some do OEX or something.

And then, it’s clear to us that we’re sort of seeing a dip in the pool of eligible veterans. And we probably didn’t as a nation stop giving limbs and it’s probably a data system issue.

Unknown: Thank you. And what did training involve? How did training evolve with successive cohorts?

Dr. Jeffrey Heckman: That’s a great question. So, certainly with the first pilot--our Shark Tank pilot with Vision 12 North and then Vision 12 South—it all started with a step-by-step process and in-person training with all of the key players.

So, we saw on that first slide the five steps that prescribe the code, the purchase, the delivery and then the follow-up. So, we identified at each of the VANC’s within Vision 12 who are providing care for veterans with limb loss that are going to be part of this process.

We invited them all out to this training. And then, we provided this in-person training. And that was very successful early on especially with Vision 12 North.

And then, as we continued to pilot, we went out to Vision 22 and the Regional Amputation Centers across the country, we recognized that we needed to identify more of a virtual approach. And so, we took that training that we developed for the in-person presentations. We turned them into video modules and then we provided them to again, the key players from Vision 22 and the Regional Amputation Centers.

And then, we received some feedback and we kind of continued to iterate on the presentations. And ultimately, we were able to take those produced video modules and enter them into TMS. So, now they’re TMS training modules that are video modules that are specific for the disciplines that are performing the activities across the process of using Flow 3 and are available to all VA staff through TMS.

Unknown: Wonderful. And then, do you have any idea why some roles were more reluctant to adopt Flow 3 beyond the reasons you described?

Dr. Jeffrey Heckman: Chelsea?

Dr. Chelsea Leonard: I think that’s a really tricky question. I think that in terms of role specific challenges for adoption, the ones that I described being maybe turnover or work duplication for purchasing agents is probably the main thing that we found. I think most of the other challenges for adoption are probably individual specific rather than role specific.

So, you know, maybe, you know, this person at say A is uncomfortable with the new technology or this person at say B is only at the VA part-time. And so, learning to use this new process just isn’t really on their radar, within their bandwidth.

I think it’s something that we’re continuing to try to tease apart as we talk to people. With the most recent cohorts we’ve actually been doing more propulsive sampling where instead of reaching out to people at every site for interviews, we’re trying to reach out to people at sites that are either doing really, really well with adoption or really poorly with adoption to try to understand that a little bit better.

So, I can’t give a really definitive answer to that. But it’s something that we are looking into.

Unknown: Thank you. And one last comment I wanted to share. “Hard to call it work when we enjoyed every bit of the journey no matter how difficult the tasks. You only have to s pend a few seconds with this veteran community to realize the importance of the cause.”

I think that sums it up very well. Do the presenters have any final remarks?

Dr. Jeffrey Heckman: Those were great! I think in addition to caring for the population that we work for and that we serve, I think that the population that we work with and our colleagues at the VA’s—I’ve been very fortunate with this project to meet VA staff all across the country. And they all really, really are the highest order. It’s been a pleasure to work with our query colleagues. It’s been a pleasure to work with VA staff across the country caring for veterans with limb loss.

So, it’s been really fun and I look forward to continuing to do that.

Unknown: Well, thank you so much to our presenters for taking time to present today’s questions.

To the audience, if you have any other questions for the presenters, you can contact them directly. Their email addresses are in the slide deck.

And please join us on June 15th when Dr.’s Carlson and Lovejoy will be presenting “An Evaluation of Firearm Injuries Among Rural versus Urban Veterans: Data, Validity and Early Findings.

And thank you once again for attending. We will be posting evaluations shortly. Please do take a minute to answer those questions.

Let us know if there are any data topics you’re interested in and we’ll do our best to include those in future sessions. Have a great day, everyone.

[End of Audio]