Moderator: Welcome to the VA HSR&D Investigator Insights podcast series. In this episode Rob Auffrey with the HSR&D Center for Information Dissemination and Education Resources talks with Dr. Seppo Rinne, Investigator with the HSR&D Center for Healthcare Organization and Implementation, Research, and an Assistant Professor at the Boston University Medical Center Pulmonary Center. They're discussing Dr. Rinne's work evaluating VA's implementation of a new electronic health record.

Rob Auffrey: Dr. Rinne, thank you for making the time in your schedule here at the 2022 AcademyHealth Research Meeting to meet with me and talk about your important research regarding VA electronic health record modernization. Let's just jump right in and let me ask you this. What brought you to VA?

Seppo Rinne: Yeah, that's a good question. VA is really an ideal environment for me in my work. I am a pulmonary critical care physician. I'm a board certified clinical informaticist. And I'm a health services researcher trying to understand how we can deliver care better. And that question is really well suited for a VA environment for many reasons.

VA is a leader in health information technology. They've been so for many, many decades, and they continue to lead the field in many of these issues. In addition to that, VA being a large, integrated healthcare system offers, really, unparalleled opportunities to contrast how different health systems within the VA implement change and improve care.

For those reasons VA has been an outstanding environment. The other thing that's notable and may come across as cliché, but genuinely is something that I believe in, that is that I believe in the VA mission. And being a part of an organization that is mission driven is something that I think defines my career and supports my career satisfaction.

I'm also an Assistant Professor at Boston University. And that's another kind of environment that has a real mission driven focus to address and serve underserved populations. And the combination of being able to work in the VA and Boston University has been really an ideal job for me.

Rob Auffrey: It really does sound like you're in the right place.

Seppo Rinne: Yes.

Rob Auffrey: Please tell me about the work you're presenting here at AcademyHealth.

Seppo Rinne: Yes. We presented information from the Empiric Evaluation. Empiric is a QUERI funded evaluation initiative to understand frontline clinician experiences with VA's EHR modernization effort. VA, as you may know, is undergoing a massive organizational change, transitioning from a homegrown legacy EHR, and that is VISTA or CPAS [PH] – CPRS, to a commercial system by the CERNER Corporation.

That EHR transition is expected to take ten years and cost more than $16 billion. Our efforts are to try to understand what are clinicians' experiences with it. What's working well with the EHR transition. What's not working well and how can we improve from one wave to the next, from one EHR implementation site to the next?

Rob Auffrey: Could you go into a little detail about your method?

Seppo Rinne: Yeah. We used mixed methods and that includes both qualitative and quantitative methods. Our methods are all longitudinal, so we're trying to understand the experiences across the continuum of implementation from a pre-go-live setting before we implement the new EHR to the go-live period, the period when people are actively implementing the EHR into a sustainment phase, and optimization stage. When people have, kind of, undergone the EHR transition and are now approaching a new steady state.

We use longitudinal surveys. We've developed a survey that compiles multiple validated metrics, instruments, to understand what our clinicians' experiences? Those instruments include commonly used metrics like the system usability scale, understanding how people interact and use the EHR; the Mini Z burnout scale, understanding issues related to workplace climate and burnout. The AHRQ safety and technology instrument, which is really an instrument that tries to understand the perceptions of the technology itself, and the training, the safety.

All of those are housed in, kind of, the survey that we administer. We also use longitudinal qualitative interviews that include, kind of, in depth interviews, pre-go-live and at select time points after-go-live. And then we use periodic check-ins, which are these just very brief interviews that follow up on prior in depth interviews and understand, what's on people's mind now? And what are the challenges they're experiencing?

Finally, we've included EHR use data or the log data. This is information that comes directly from the EHR. It's basically an assessment of how people are interacting with the EHR. It may include things like time spent on the EHR, time to documentation, time to orders. When those documentation and orders are placed. On a granular level, it may include click counts and scroll times.

And all of that's compiled in a way that helps us understand a narrative of what people experience. We use really an iterative approach to mixed methods. I would say broadly speaking, we use a convergent parallel design, which basically takes the qualitative methods, and the quantitative methods, and triangulates them, looks across these methods to understand what are the findings, and the stories, the narrative that comes out of that? But we also use an exploratory sequential method during the longitudinal data collection. There may be something that emerges from the qualitative interviews that we feel like we need to incorporate in our surveys that will allow us to assess how widely felt this feeling is, this experience is. It may be about safety or training. And conversely, we may hear something. We may see something in the survey that we feel like, yes, we need to drill down on that in the interviews. And we would add additional interview questions. I think overall, the short answer is this is a mixed methods evaluation, and we use an approach that's common in evaluation efforts.

Rob Auffrey: Thank you. How about key findings?

Seppo Rinne: We have several key findings, the largest of which is that the EHR transition was profoundly disruptive. It impacted perceptions of work satisfaction. It impacted feelings of burnout and it even impacted turnover intent. That concept was drawn from the qualitative interviews and from the quantitative surveys. And we really saw that in a resounding way. This was a challenging EHR transition.

We also have several other key findings that relate to the clinician experience. One of those is that the training was poorly tailored to end-users' needs. There are many examples of how the training did not fully incorporate adult learning principles, especially at the first, initial EHR transition site where the EHR wasn't available. It was still being built at the time of the EHR transition. And there wasn't the opportunity to basically learn the system prior to, and work with the system prior to go-live.

We found that there were challenges using the new EHR, and those challenges impacted patient safety. They created, at times, hazardous conditions and challenges that end-users identified. And those perceptions of difficulty using the new EHR persisted over time, even in our latest interviews, which were a year after go-live.

We also found that there was a difference in the lived experience of frontline clinicians and some of the top-down communication that was delivered. Early on, there was a lot of communication that the EHR transition was going very well, and there was a very positive view of the organizational change. But end-users really struggled with it, and they didn't feel that experience. There was a disconnect. Even later on, even in our most recent round of interviews, we've seen that the experiences on the ground are not always reflected by top-down communication.

We found several key findings that led to recommendations of how to improve subsequent sites. And we've worked with our partners to really iron those out, and try to codify those in a way that will impact, and improve future EHR transition efforts.

Rob Auffrey: And did this difficulty with the new system affect patient safety?

Seppo Rinne: There are several examples of how patient safety was impacted. And a lot of that comes from our qualitative interviews. And this has been a major focus of VA and a focus of improvement efforts. In general, the new EHR is a…. Maybe I'll even take a step back and say that EHR transitions are complex. They're messy. It's not a simple technology of change. It's not just going from using an iPhone to an Android.

This is changing how we interact and deliver care. There's adaptive changes and cultural changes that are necessary in order to realize EHR transitions. Those changes are challenging. And prior literature has indicated that there are safety concerns with EHR transitions. We observed those in our initial EHR transition site and at the Mann-Grandstaff VA. And that is that there were a lot of patient safety concerns that were issued as tickets that were reported to CERNER.

There was, in our interviews we heard a lot of the frontline clinicians describing their concerns for patient safety and the hazardous conditions that the EHR transition created. Some of that could span a whole host of different issues. And some of it was related to how people interact with the EHR, and some of the usability features. Some of it related to specific issues related to ordering. Who is making the orders?

Some people got access to be able to order medications maybe they shouldn't be able to order, and that again creates a challenge. Some of it related to pharmacy concerns, especially related to data migration. As data was pulled from VISTA or CPRS into the new system, there were many errors, both errors of omission; that is that medications that patients should be on were no longer listed as on their medication list. And medications that they necessarily weren't on or shouldn't be on were added inadvertently. There are a whole host of issues that create these sometimes hazardous conditions and sometimes even safety concerns or safety events.

Rob Auffrey: What, if any recommendations came out of this research?

Seppo Rinne: Yes. We listed our recommendations across several different levels. And we basically used organizational structures to try to anchor our recommendations, that include recommendations for leadership and preparation, recommendations for the communication, recommendations for EHR support, recommendations for training, and recommendations for continuous improvement.

Those recommendations in many ways seem fairly basic and are consistent with a lot of organizational change, literature, and theory. But what we heard from our frontline clinicians is even as some of these are very basic recommendations, they didn't feel like those were lived experiences during the EHR transition. We felt it was important to underscore these recommendations and really identify, kind of, key steps that EHR transition sites can take to improve their efforts.

If I were to go into a little bit more detail, I think I'll hit some of the highlights of the things that I found were most relevant. A lot of that stems from the leadership level. It's hard to draft a concrete statement or recommendation for leadership. Because in many ways, it is a culture change. It's something that leaders need to embody and support in a way that doesn't always follow concrete steps. We recommended leaders view this as a comprehensive and cultural change.

In other words, this is not just a technology change, but it is an adaptive change that impacts every facet of care delivery. Acknowledging that, and supporting that, and really communicating, and embodying that support is critical.

We also recommended leadership recognize some of the necessary preparations for this and engaging end-users in, not only just listening to and acknowledging their concerns. but also engaging them in some of the improvement efforts. Obviously, this is a large organizational change impacting every VA, but we felt leaders have a role to listen to their frontline clinicians, and really incorporate their recommendations.

With respect to communication, we recommended that the communication be clear and have clear points of contact. As we heard early on, people didn't always know where to turn for help or advice or where to get the information, but having clear points of contact is critical. Those clear points of contact should deliver messages that reflect the known challenges, pain points, and frustrations.

Some of the difficulties with delays and the timing of go-live or the timeline for EHRM need to be communicated as early as possible, and as directly as possible. Again, as I mentioned before, we heard early examples of positive communication that did not reflect the lived experience of frontline clinicians. This is another example just to highlight the importance of saying, "This can be challenging and this will be challenging." And there are specific areas where we've identified some of the most difficult changes.

For communication, we also recommended having clear feedback on issues that arise. As people submit recommendations for improvement, those recommendations need to follow, kind of, a process that offers the people who submit those recommendations some feedback about how they're being processed, again, which was not always done at the first EHRM site.

We have a whole host of recommendations on communication. For training, we recommended, really, using principles of adult learning theory. And that means giving people the opportunity, the protected time to train with a new EHR, allowing them to have independent, and self-directed learning, and supporting a training focus that is aligned with end-user roles.

A physician doesn't need to be trained on the workflows and processes of a scheduler or of a nurse. Tailoring the training to meet physicians' needs and conversely, having every other role being specifically trained for their needs, again, something that wasn't always realized in the initial EHR transition.

After go-live, there is a need to optimize training. Not only leaving this as an effort that happens pre-go-live where, when people are getting ready for the transition, but after go-live, figuring out, how can we do this better? All of us, when we learn a new technology have, kind of, an initial impression, and are able to get by but there's an opportunity to revisit ways that we can improve our technology use.

With respect to support, we recommended having support that is available in ways where people can know where to turn to for support. There's guidance on how to get the support that people need. We recommended, again, ensuring, kind of, feedback on issues of support and how to address issues that do or rise.

As far as our recommendations for continuous improvement, we recommended that VAs really, again, engage the end-users in understanding, how can we do this better? And not only from within the site, but also consider these peer support networks that can draw on prior sites that have gone live, learning from each other about what we can do to be better.

And then finally, we recommended more efforts to invest and support evaluation efforts. We believe in the principles of high reliability organizations. And one of those core principles is to incorporate continuous improvement, learn from what we're doing well, and what we're not, and being able to disseminate that information.

Rob Auffrey: You've used the term culture change a couple of times. And I know, you just went into detail on some of that. But what I'm picking up on is a recommendation for culture change at the top.

Seppo Rinne: Yes.

Rob Auffrey: Could you expand on that a little, please?

Seppo Rinne: Yes. I think, absolutely, there's an opportunity and need for leadership at every level to support a culture change. And that is to support and acknowledge the need for comprehensive changes that go beyond just learning the new technology. There is a term that came out of the Mann-Grandstaff clinicians, and that was buttonology.

A lot of the training they had said, basically, reflected this process of pointing, go here, click this, go there, click that, without, kind of, addressing the larger need for the EHR, and the workflows that people use to treat patients. How do I treat patients, not just where do I click? That idea of incorporating a larger culture change is critical. And leaders are a major driver of that culture change.

It is also an important opportunity for me to take a step back and say that our evaluation efforts were focused on end-user experiences. And what we found was that even in the Mann-Grandstaff VA, some of the things that did go well was the peer-to-peer support. This was a challenging experience for clinicians.

And what they were able to do is figure out how they could learn from each other, how they could support each other. And how they could identify the appropriate methods to complete their work and sometimes workarounds that were necessary to do the work that they needed. That, in a way is culture change, also, from the bottom up.

Rob Auffrey: Do you work with Veterans at all in this research?

Seppo Rinne: No. That's a very good question. Our focus is on the end-user experience with the EHR. And we did not incorporate the Veterans as part of that end-user experience. We looked primarily at the clinicians and staff, but even from our clinicians and staff we heard a resounding concern about how patients are interacting with the EHR, and the challenges that Veterans have in communicating with their providers.

Several examples of that were that in the VISTA CPR system, medication refills were entered through patient portals. As the Mann-Grandstaff VA adopted CERNER, Veterans tried to continue doing the same thing, and were not able to get the results they needed. The consequence was that Veterans ended up showing up in-person sometimes.

The phone lines were busy and backed up, and so Veterans showed up in Urgent Care just for the medication refills. That's an example of how EHR transitions pervasively impact everyone. And an acknowledgement of the need to understand how Veterans adapt to this new system change.

Rob Auffrey: Well, thank you, Dr. Rinne. Is there anything else that you'd like to add?

Seppo Rinne: No. I'm grateful for the opportunity to describe our evaluation. More work needs to be done, and that includes additional evaluation efforts, more partnered work. We really need to work together to figure out how do we do this better? Where are the challenges, and how can we identify ways to improve the process?

Moderator: The views and opinions expressed in the preceding podcast are concerned with the scope of recently concluded or ongoing VA HSR&D funded research, and do not necessarily reflect current or to be implemented VA policy. To learn more about this research, visit the VA HSR&D website at www dot hsrd dot research dot VA dot gov.

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