



Aging in Place Supported by Continuous Wellness Monitoring

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Healthy Seniors Pilot Project
Projet pilote sur les aînés
en santé



Video | Vidéo



Slides | Diapositives

My name is Pat Kelly, I'm the founder and CEO of Routinify. I started Routinify several years ago based on my experience caring for my aunt, 107, and her baby sister, who's my mom, has just turned 101. We've now expanded quite a bit since those early stages. Today we're talking to you specifically about application for those individuals aging in place at home, but the underlying technology is being successfully used in the province for long-haul truckers with diabetes, pre-diabetics, we have lots of individuals with chronic heart failure syndromes, we have young adolescents with various behavioral challenges, so the underlying technology and the process applies to a variety of areas. But today we're going to focus very specifically on aging in place and we're joined by my partner Dr. Keith Brunt.

Hi, I'm Keith Brunt, I'm a Professor of Medicine and Pharmacology here at Dallas Housing Medicine New Brunswick based in Saint John. I'm also the translational scientist at the New Brunswick Art Center I started working with Routinify after I was introduced to them by Opportunities New Brunswick and OCOA. We were looking to establish sort of the guideline directed evidence-based medicine behind the scenes in the operations of virtual care delivery platform and so I hope to touch on some of the highlights and I'm looking forward to the Q&A to sort of address how this has shaped around the virtual care delivery system in our province.

So if I open up with sort of what the impart teams' main role was in this, I want to introduce the concept of the investigator team itself. We're a group of engineers, clinicians and scientists that sort of work collaboratively with innovative technology providers to ensure that we're meeting sort of the four key elements of any solution that comes to the Health Care system. That usually will always start with a goal to improve the clinical outcomes or at least meet the standards of care that we have in accordance with guidelines to health outcomes. We're almost always looking to evaluate a system or develop a system with a focus towards lowering the cost of the delivery of care and that could be cost in terms of material costs or time costs. We absolutely are looking for two critical elements: better patient experience with our health care system and, of course, the improvement in the healthcare provider satisfaction overall. In this way we kind of divided our mission around what I would say six primary focuses understanding the needs of seniors. Their desire for independence, their need to have human factor development suited to them so that they would have systems in their home that is as easy to use as Facebook or anything else, we knew that we needed to look to the Health Care System itself to make sure that we were improving. For the 21st century, the healthcare system is certainly in need of automation and digital tools to improve work efficiency, but these tools must be patient-centered, not administrative centered. They should adhere to the needs of a patient. We're also considering the health care worker and a lot of our development and strategies and guidance that we provided to this system, healthcare workers need to feel connected and supported by

technology, not burdened by technology. That was a major driving force for us. We wanted to simplify and make sure that things improve the work-life relationship with patients and physicians. Primary care providers were a major focus and that's our formal care providers, that's primary care physicians and nurses but it also considers informal care providers, spouses, children, neighbors, community agencies and the need really for what is evolving to be what we consider the medical home for patients: that patients have good coordination of their health care plans, that scheduling is made easier, that data flows readily between the decision makers and the decision users of health care plans and outcomes. Fundamentally, I think something that we're all working towards is reducing the burden on our ER systems for low acuity care when we can provide that care effectively at a community level. Of course, the government is important in all of this, the government is trying very hard to build a good health care system that ensures patients are followed up and that they have good access to care, it's reliable, it should be easier. Certainly we want to use the human resources that we already have in place to amplify any delivery of care and, more importantly, we're also quite interested as a government to look at home growth technology solutions and this is definitely something that was built in New Brunswick by New Brunswickers for New Brunswickers and involved engineers, clinicians, you know, very social worker inputs, of nurse inputs so and of course listening to the patients that were using the device throughout the iteration process to understand what was working, what wasn't working for them

as we modified the system to the pilot that will present some of the highlight data for today.

Great, thank you Dr. Brent. So just a quick overview of the elements of the platform. The device consists of a tablet, that is one or more tablets that are in the household environment, and there it serves as a hub for a variety of things. One is what we call the internet of medical devices, so we're connected to pulse oximeters, glucometers, accelerometers for measurement of sleep behavior and physical activity, a variety of other elements. So we erase from any patient or any user the requirement to understand how to connect to those devices and the myriad of separate apps for that, we integrate all those into one. We focus a lot on lifestyle behaviors, so exercise or lack thereof, which is one of the challenges that we encountered in this particular pilot. Try to help people actually get up and move about more. Sleep activity, we discovered lots of individuals with undiagnosed sleep apnea and other sleep challenges. We have an integrated Telecare telemedicine platform, people are certainly you know free to use maple and others but it's not necessary. So we have a HIPAA compliant voice and video mechanism, it makes it very easy for those types of conversations to take place. We do an awful lot of in-home care coordination. So in some cases there were in outside In-Home Care Services being provided in addition to our virtual care services, as well as other nurse coordinated activities. So we have a single calendar repository for who's on first for once any specific action. Nutrition, hydration, big areas of focus as well. Med

compliance, we want to keep people out of the ER, at least unannounced or unanticipated ER visits. Med compliance is a big deal. We certainly incorporate automated med dispensers but our findings have been that most times compliance is just "I forgot" or "there wasn't anybody there to know that I forgot and give me a gentle nudge, a reminder". Mental actuation, whether that's in the form of socializing with other individuals, so depression resulting from social isolation. We have lots of other applications around the device that help people through these various areas. There's also other assistive applications as well, whether they're big based other, voice forward based on Alexa or Google or others and the last areas we really brought to these individuals homes, access the community and government resources. Yes, there's lots of great internet out there, lots of great websites that people have spent a lot of time on, but the challenge is it's hard for people to remember where they are and what the URL is and how to open the browser. We automated all that, making the community and the government resources very tangible and accessible. What did we do? We identified 58 aging seniors that were living in-home, we partnered with a medical care provider, Valley Health, we deployed the systems in the home environment with the associated sensor devices that we talked about, we augmented those services with our own remote care workers. So Routinify employed several nurses and licensed clinical social workers who would be interacting with the aging adults on a daily or multiple times during the week. So we really surrounded folks with care. It's not just digital care being pushed on

them, it's digital care that's actually extending, augmenting, magnifying the care that's delivered by humans.

There's lots of details here; most of those results, I apologize, I don't know the exact mechanisms for who can access that data but, if necessary, reach out to either Keith or myself for that. The top line result I wanted to discuss with folks there, is that seniors do understand tech. Everybody says seniors don't rock tech, it'll be a failure, maybe when your generation retires this stuff will work if it's designed properly, if it's deployed and utilized properly and if other people around the aging adult and what we call the care circle actually assists, not in training but referring to that: "Hey, how well did you sleep last night, what was your physical activity today?" then people have zero issues. We found more challenges with caregivers having challenges with it, with technology, than the actual aging adults themselves. Dr. Brunt, I'll allow you to just give the highlights of some of the findings that we found.

Yeah, we ran this trial as well as developed this in accordance with sort of guideline care and chronic illness. We were most concerned with majority illnesses, related cardiovascular disease, diabetes, but also cognitive impairment was seen as a salient for us from the medical feedback that we got from physicians and patients and community organizations. One of the elements we've detected in this study very early on was sleep quality. Something that is very difficult to assess in a primary care setting. It's usually a

recall history and people asked 'how are you sleeping?' They'll say "fine", but it's also a significant marker of mental health or physical issues that need to be addressed and we saw that we could identify quite a few issues in those 58 patients. Several patients were undiagnosed with obstructive sleep apnea and of course that has risks for heart attack and stroke being undiagnosed, particularly in that age group. We found that there was a low amount of physical activity in many of the seniors and there was very intermittent medication compliance and care plan. So whenever you visit a physician, you can appreciate that they will give you a prescription and they'll give you some medical health advice and the hope is that you'll remember that when you go home and you tell your informal care providers, your spouse, your children, your friends, family. We found that we could quickly, through the system, identify and guide those patients to sort of a level that was appropriate for their needs individually, to how much compliance reminders they wanted for medication and nutrition physical activity was sort of something that happened automatically. Because we had this awareness of how active they were, we encourage them to through the system to improve their activities. This became what we call medical gamification, so the patients actually took that challenge onto themselves and, because they were situationally aware about how inactive they were being, they saw that they were only maybe getting 500 or 1,000 steps or movements in the day. Most of those patients responded very quickly. We also integrated with other HSPP projects, so 'Zoomers on the go', for example, was able to join our system in the virtual space and many of our

seniors participate in that willingly and thought that was great, not only for the physical but for the social and mental actuation. The biggest feedback I think we qualified at the start was a reduction in loneliness. People felt connected, they actually felt connected to the Health Care System, because it was continuous, they could see how their health was improving, they could see how their sleep was improving, they could see how their vitals, where their they had diabetes and were monitoring their glucose or whether they had hypertension or moderate blood pressure, they could sort of appreciate and see how the medications and the activities that they were undertaking were slowly improving those readouts. And again, that just general sense of well-being was improved. What we didn't expect, which was very salient, was how much the care providers actually showed a relief there was a huge improvement in indices of caregiver exhaustion physical burdens and social emotional burden time all being reduced by anywhere from 46 to 71 so the fact that the care providers, whether they're formal or informal, were alleviated by the care receivers using this system and integrating through this system. There was a lot less repetitive nature and people seem to be less concerned that nobody was paying attention to them. For some of the patients and the seniors receiving this, some of them had been very isolated and so this was a way for them to socialize through the system or feel more connected with their health care provider team. And certainly we were able to navigate through the system to some of the community partners that have integrated with this overall, healthy habits were improved, care receiver loneliness was reduced and sleep quality was

significantly improved and we also identified, even though this is a small population, several new diagnoses that went undiagnosed for some of the participants that didn't realize that they had chronic conditions. So we identified new issues of hypertension and new issues of heart failure that were then able to be referred and medically managed appropriately.

When we looked a little bit towards the remote care workers, this was interesting because there's a blend of the care circles. So the primary care team of physicians and nurse practitioners engaging with the seniors could sort of design the care plan and, if this was digitized by the Routinified team, that care plan is really the actions that we request of patients to follow through right, that could be improved: eating of vegetables and fruit to improving activity but mostly it's about finding that right routine in a day, hence the name Routinify, for somebody to be healthy and aware of their health care. The nurses certainly responded very well, they found the system was supporting them, they were more easily focused on the priorities of vital signs or actions that they could report back to physicians for medication adjustments for example and the in-home service providers, though they appreciated the system, they did find that they were a little concerned by being monitored so they were they were a little nervous about engaging with the system for two things they didn't want to be, you know, held liable for something that they didn't do in the care plan and they were unsure if anything that they were doing with the care plan was going to be remunerated properly. We did learn that there are still improvements to be

had, particularly if we're going to integrate our current Human Resources, be that extramural care or home support services, we want to make sure that we're reassuring them that this is meant to help sort of reduce the burnout that they might otherwise be experiencing or improve the efficiencies of the leave-in-place care. In a nutshell I would say this: everybody in the world would love to have a physician living in their home with them all day so that they could ask them questions or get feedback. This system provides that portal to that level of information as readily as Facebook would. There is no training for the user, a senior can simply turn the device on and use the system and, in the back end, that's where the evidence-based medicine and guidelines are informing what kind of digital care plans we're deploying. What kind of digital therapeutics might be appropriate and what vital sign instruments we want to deploy in the home to help manage that chronic condition. So that could be activity monitors or fall prevention, blood pressure monitors, you name it. We think that the salient right now is to really get these systems into the hands of people who are having early cognitive impairments, either by traumatic brain injuries or stroke, to integrate with other navigation systems to help sort of improve the continuity of care, but then also work collaboratively with primary care practices to make sure that information that's desired to be entered the medical record is flowing appropriately there.

I wanted to leave off with just a couple quotes that we've pulled. Of course, we can't say everything that all 58 seniors quoted. There does seem to be a lot of

anxiety about losing the system, it's something that I have brought to the attention of others, that the patients are concerned that now that they've gotten comfortable using the system, they're afraid that they'll be abandoned again. And so I am working with several different options and opportunities to try to keep this going, but we've seen it in activity, for example the gamification, people readily, without any reinforcement, just tripled or quadrupled their activity through the day. They loved watching their blood sugars improve over the months. I think that was something that they just, they knew that the drugs were there to help them, but to actually see the outcome of taking those medications and improving that activity just reinforced the care plan itself. And that required no direct intervention by Primary Care. Some really felt supported during their cancer recovery, for example, or they felt supported that somebody was watching if something went off of their blood sugars or there was instability, they felt that they could refer back to it and would be heard and trusted because there was information to sort of support what they were saying or what they were feeling. And oftentimes our Primary Care Providers would get ahead of these before the patient needed to set an appointment. We had certain Flags pre-set so that if there was instability in blood pressure... would flag it to the attention of the nurse, the nurse would do a check-in with the physician to see if the medication was actually being prescribed appropriately and often changes were being made well before the patient even realized it. So, very proactive approach to Home Care, the system itself can also interact with any application, so it provided instantaneous access to existing virtual care supports

and, in the back end, it can also interact with many of the virtual care supports that are ongoing. I think the last line said "it's one of my favorites, I'm really grateful for the companies and researchers who worked together to enable seniors and diabetics such as this patient to have a better quality of life. I would absolutely participate in another study. Definite yes." You know, I wish more public awareness could be had around the success of our health care system. I think morale is at an all-time low, burnout is an all-time high. We have to find ways to automate these systems to make sure that patients feel cared for, that they feel connected with the outcomes that we're trying to all achieve for them and systems like this can actually integrate a lot of that. Moreover, it's driven by the primary care team, the Physicians, the nurse practitioners, Pharmacists, they are the ones making the evidence-informed licensed care plans that the patients then follow. So it's really important that we work within the system that exists. This sort of defragments some of the care that we see often between sites, between Specialists and primary care, and between different groups like Community Pharmacy and Physicians was very helpful in that way. The next step is, of course, I'll pass back to Pat. You know, if there's any questions about the actions that we took or some of the more details around certain key patients, I'd be happy to answer those, but Pat will tell you sort of how we could maybe adopt and implement this system.

Yes, thank you, thank you Dr. Brown. So we're ready. This isn't a pilot implementation, this is not pilot technology, we're not a pilot company. We are

ready and have proven our ability to scale, you know what, much larger than what we deployed here for the HSPP pilot project and, as I indicated before, it's applicable in areas other than aging adults. There's a little bit of a gap, so we would prefer to not necessarily be the... we would be the last choice, if you will, it probably sounds the wrong way... we would provide the virtual care services, but we would prefer to train other existing organizations to provide those services to augment their current in-home services or their provider Network Services with the virtual care services. But we will be the safety net. We've proven that we can provide the service, that we can readily hire. We don't see there being any resource challenge in that regard. What sits behind this is really a healthcare contact center but, contact if people are calling you to talk about their ailments, you've already failed. If you have the right inputs, the right sensor devices, you've surrounded people with the right monitored and moderated care, you're going to know before they do that maybe an intervention or a gentle nudge is required. People report their own challenges too late; not all people, but the vast majority wait until it's very, very serious and since we're monitoring the individual in a non-invasive, you know, privacy-centric fashion, we can see things coming, we can help them see things coming, we can anticipate, we can intervene before things escalate beyond control and with that, that's our presentation for the day.



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