

## Blood pressure

● SYS min-max: 93-126

○ DIA min-max: 58-88

LOW RISK



February 2018

## SmartCoach Remote Monitoring Program

*A Groundbreaking Approach to Address the Growing Burden of Chronic Disease on Health-Care Systems*



## OVERVIEW

Anywhere you look, the demand on health-care systems and the brick-and-mortar buildings where patients are treated is vast. When you mix acute problems with chronic diseases and an aging population, there is a perfect storm settling over cash-strapped hospitals, packed waiting rooms, and busy clinicians.

This is felt to the greatest degree when you consider the most burdensome diseases out there: chronic heart failure (CHF) and chronic obstructive pulmonary disease (COPD). When these patients visit their local emergency department (ED) and/or are admitted to hospital, it not only strains the health-care system, it ultimately hinders their well-being.

Being in hospital for days on end for what may be unnecessary reasons inflicts a major burden on patients' quality of life, their actual prognosis, and on the health care system. Simply put, patients are more likely to return to hospital and when they do, they stay for a long time. In fact, in 2012, the direct costs associated with chronic conditions was estimated to be at over \$50 billion in the U.S. alone.

The situation will only become increasingly dire. In Canada, for instance, it is estimated that by 2036, one in four Canadians will be over the age of 65, and 85 per cent of that group will develop chronic conditions. Heart failure alone is already a multi-billion dollar annual problem here.

The consequences of this rising demand are enormous. Finding a solution to manage it: imperative.

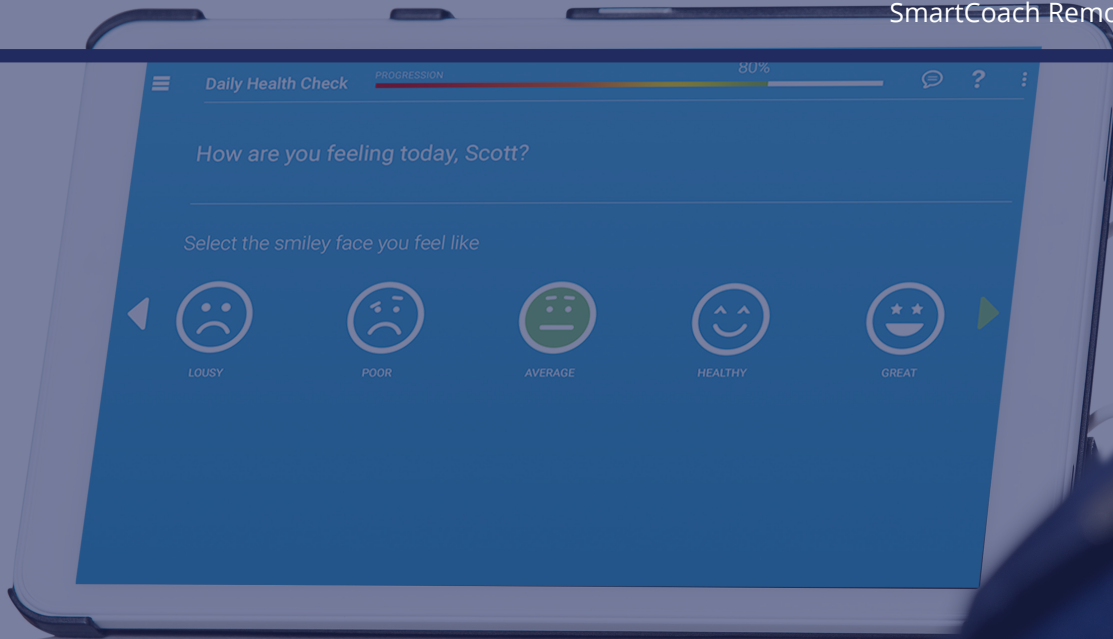
We wanted to know: what if remote patient monitoring (RPM) data collection and analysis could illuminate the factors that precede a patient going to hospital? And then prevent them from having to do so?



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To that end, in 2015, AlayaCare partnered with We Care, a division of CBI Health Group Canada's largest provider of rehabilitation and home health services. The two companies considered an innovative approach to reducing adverse events leading to emergency department (ED) visits and hospital admissions. Two years later, we began a collaborative research project with Southlake Regional Health Centre and Health Informatics Research at the University of Ontario Institute of Technology to test the potential impact of RPM in specific patient groups.

And we started with the toughest challenge: CHF and COPD, the diseases that are most difficult to manage and impact patients, caregivers, families, and care facilities the most.



## OBJECTIVE

Overall, we sought to:



Demonstrate that RPM could reduce hospital utilization for chronically ill patients (specifically: COPD and CHF)



Study how RPM impacted patients' ability to self-manage their chronic disease after being discharged from hospital



Analyze to what extent machine learning-generated risk scores could predict adverse events, which land patients in emergency rooms and in the hospital.

## CHALLENGE

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Healthcare delivery is traditionally designed around providers inside hospitals, clinics and doctors' offices. Yet there is a move away from formal, institutionalized care and toward more patient-centric care. Through this shift, care flows to the patient, instead of the patient being responsible for seeking the care.

*Can we keep sick people at home and can we keep them well?*

It is no secret that RPM is considered to have true potential to improve the quality of life and care for patients. Equipping nursing teams with the ability to gauge real-time vitals from afar, supported with novel artificial intelligence that powers the analysis of huge reams of data, is changing the face of home health care.

This fact is not lost on AlayaCare, as we have steadfastly ensured that our technology fully embraces the potential of RPM. Our experience with real-time data collection to date has revealed many clear benefits: enabling clinical staff and supervisors to monitor clients from afar; reducing unnecessary and costly visits; and proactively addressing client needs, for starters.

While our own experiences have been promising, it was important to quantitatively demonstrate how RPM could assist patients with chronic conditions such as CHF and COPD and potentially lead to reduced health care costs, as well as improved patient outcomes across the health-care continuum.

Thus, AlayaCare united with a top innovative hospital in Southlake Regional Health Centre, Canada's broadest health care provider in CBI, and the Canada Research Chair in Health Informatics via the University of Ontario Institute of Technology under a new Ontario Centres of Excellence program called "SmartCoach" to test a theory: can a specialized RPM system identify early warning signs, and can it help both patient and care provider?



## A GROUNDBREAKING STUDY

Within the scope of CHF and COPD, the project focused on hospital readmissions, ED visits, health system utilization by these key patient groups, patient satisfaction, and whether all involved family health teams were pleased enough to want SmartCoach continued and expanded.

The study sought to answer several key questions. Could we use remote patient data to develop a risk score prediction for hospital readmissions? Could we prove if RPM and telehealth help CHF and COPD patients avoid trips to the hospital and dangerous incidents like falls at home? Could a telehealth solution empower patients to better manage their own health? Could it keep them safe, at home? Could an acute care facility work in tandem with a private service deliverer to implement a RPM solution?

For AlayaCare, our role was to inject our pioneering technology into the project. This includes RPM software, a patient app, a telehealth dashboard, family portal, and AI-powered clinical support tools that permit greater coordination of care across multiple caregivers.

## ABOUT SmartCoach

SmartCoach is a remote monitoring system that uses wireless technology to connect patients living with chronic diseases to care providers who monitor their vital signs remotely, providing assessment of vital signs (blood pressure, pulse, blood glucose, weight and blood oxygen), information about managing their illness, and adjustments to their care plan. The main focus of the project was to reduce unnecessary hospitalizations and emergency room visits while encouraging and allowing patients to manage their conditions at home. Using Alayacare's technology, CBI Health Group successfully brought on 75 patients and worked closely with the COPD and CHF clinics at Southlake Regional Hospital.

## SmartCoach RESULTS

The SmartCoach study revealed four key findings:

- Remote patient monitoring successfully kept chronically ill people out of the hospital. Among this group of CHF and COPD patients, there was a 73% reduction in ED trips and a 64% reduction in the number of hospitalizations.
- The number of patients who needed at least one hospitalization dropped 35% in the study period, from 57% to 22%.
- Over a three-month period, RPM costs were about \$50,000. Yet, for a sample of 74 patients, the cost savings were estimated to clear \$150,000 (limiting the number of patient stays in hospital).
- As patients reported that SmartCoach made them confidently better able to self-manage their chronic disease, there was a 65% drop in how much they used the health system compared to what they had been doing before.

Meanwhile, SmartCoach also uncovered some intriguing facts that will propel future follow-up studies. They set the stage for altering how we clinically manage such high-risk patients. For instance, gender was found to be a huge factor relating to readmissions. Men are 3.5 times more likely to be hospitalized and twice as likely to have multiple ED visits.

Having a past medical history was, unsurprisingly, also a significant factor in predicting hospital visits. Of the many patient vitals that were tested, including blood pressure and heart rate, it was a patient's weight that was found to predict hospital admission. As importantly, those other vitals were not seen to predict admission. This helps to tailor RPM to focus on the most important factors that keep patients out of hospital.

"Patients were monitored using tablets, blood pressure machines, saturation monitors and scales. They had calls from nurses who would check on them on a regular basis, as well as when an alert was detected. If there was ever an issue, we would bring the patient into the clinic. The technology definitely helped reduce hospital readmissions. I believe that all chronic diseases should be followed at home."

-- Lise Price, Respiratory Therapist, Recruiter

## SmartCoach & BEYOND

SmartCoach has revealed how custom-built RPM can improve the delivery of care while trimming expenses. While this study focused on two diseases, the benefits of RPM can be applied to a variety of chronic conditions. This study is just the tip of the iceberg that, under the surface, reveals serious cost savings from all players on the health zone and better-managed, more satisfied patients.

There's no doubt that given the opportunity, patients have an incredible capacity to care for themselves -- a crucial benefit, given that the ability to care for our aging population is under strain worldwide. People want to stay at home, and if they're empowered to care for themselves in a safe and reliable manner, they can absolutely achieve better health outcomes.

While no technology can completely replace an in-person visit, RPM can make virtual home care visits possible, where and when it make sense. SmartCoach reveals valuable insight for agencies in the home care market, such as CBI Health Group that joined this study: greater transparency in data sharing and coordination allows clients to remain in their homes longer and in greater comfort, ultimately lessening the burden on hospitals, nursing homes and other care facilities.

Receiving up-to-the-minute data enables preemptive care that can either prevent unnecessary hospital visits or promote more efficient interactions between clients and their care providers.

We're only starting to uncover all of the possibilities, and AlayaCare is thrilled to be part of this exciting evolution in the homecare industry. With a modernized, consumer-focused platform, we believe we can dramatically improve operations for aged care providers and their patients.

"I would strongly recommend SmartCoach to others. Using the program gave me security knowing somebody else was able to see my results. Because there was someone reading my stats, I found that I was doing my exercising and eating properly to make sure there were good readings."

-- Linda White,  
Study Participant

## About AlayaCare

AlayaCare is a provider of award-winning, cloud-based home health care software. With an end-to-end solution spanning clinical documentation, back office functionality, client and family portals, remote patient monitoring, and mobile care worker functionality, we offer a platform for agencies to propel towards innovation and home care of the future.

## About University of Ontario Institute of Technology

The University of Ontario Institute of Technology advances the discovery and application of knowledge through a technology-enriched learning environment and the delivery of innovative market-driven programs responsive to the needs of students and industry. With more than 10,000 undergraduate and graduate students enrolled in more than 75 programs, the university promotes social engagement, fosters critical thinking and integrates outcomes-based learning experiences inside and outside the classroom. The university's commitment to accelerating economic growth and social innovation is realized through faculty research collaborations with leading organizations such as Ontario Power Generation, IBM, The Hospital for Sick Children (SickKids) and the Durham Regional Police Service. To find out more, visit [uoit.ca](http://uoit.ca).

## About CBI Health

Founded in 1974, CBI employs almost 10,000 clinical and support staff that deliver comprehensive healthcare services through more than 250 facilities. Our services include: community and hospital based rehabilitation centres, home health, neurodevelopmental treatment, assessments and medical services on behalf of individuals, third party funders and governments. Our purpose is to improve the health of Canadians by shaping standards and driving innovation in community care. For more information, visit [www.CBI.ca](http://www.CBI.ca)

## About Southlake Hospital

Southlake Regional Health Centre is a state-of-the-art regional hospital offering advanced levels of care to more than one million people who live in northern York Region and south Simcoe County.

Southlake offers 408 patient beds and accommodates more than 110,000 visits to the Emergency Department, 30,000 inpatient admissions, and 530,000 outpatient visits each year. As a regionally designated site, Southlake is responsible for developing and providing advanced levels of care to the more than 1 million people who reside in York Region, Simcoe County, and in some cases, as far north as Muskoka.

Advanced, specialty services include arthritis care, cancer care, cardiac care, cataract surgery, child and adolescent eating disorders, mental health services for children, paediatrics and perinatal care, and thoracic surgery.

**Better Technology, Better Outcomes.**

### **AlayaCare**

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