In-Home Monitoring Data & Predictive Analytics
Create Insights That Empower Care Teams to Achieve Better Outcomes & Lower Costs

APRIL 2018
• Often-fragile dual eligibles value the focused, proactive attention
• Managed Care Organizations value the impact on member outcomes and costs
• Advanced analytics technology provides a powerful competitive advantage

Introduction

Data from outside traditional claims analysis – such as public records, patients’ perceptions, wearables and monitoring platforms — represents an increasingly vital source of patient management information, thanks to advances in data gathering and analytics capabilities. And as seniors seek to live independently at home as long as possible, including the complex and fragile dual eligible population, those advances have made data from in-home monitoring an increasingly essential source of that information.

As the economics of healthcare move from an emphasis on volume to an emphasis on better value at a lower cost, Managed Care Organizations must marshal every resource they can to keep senior members healthy. In-home monitoring is becoming one of the key tools in that effort.

The data produced by monitoring devices must be dependable to be useful. That gives passive monitoring a powerful advantage, especially when it’s backed up with the right predictive analytics to give care teams insights they can act on immediately, before expensive emergency intervention is required. Studies show that immediacy improves outcomes and lowers costs — and dual eligible plan members value the personalized care team attention. That and the kind of cutting-edge analytics that MCOs must adopt to thrive provide an important edge in the competition for new member markets.

“Social determinants of health are viewed as one of those extensions of traditional claims data that will allow us more accurately to identify patients for intervention.”

Real-Time, Real-World Data Is Increasingly Vital

Big data just keeps getting bigger and bigger.

In fact, it’s no exaggeration to say that “data is permeating every component of the healthcare ecosystem;” it’s a fact as well that all the new data powers technologies that enable enhanced patient engagement1 – an important element of efforts to improve quality and lower costs. Now, the stores of traditional digital patient data – which are themselves expanding exponentially – are being supplemented with newly digitized data from often unexpected places, producing an even clearer picture of an individual. Non-traditional health data is simply “relevant information gathered from sources outside the scope of current data collection methods,” one report explains2 – and while it includes position-based activity patterns collected by smartphone accelerometers, e-health apps and metadata from social media, it doesn’t all come from complex technology.

Indeed, researchers at Johns Hopkins University report that medication fill rates could be an important piece of an organization’s care management efforts,3 and details on patients’ attitudes and values can be obtained through simple surveys, focus groups or observation.4
As well, says Ian Duncan FSA FIA FCIA MAAA, adjunct professor of actuarial statistics at the University of California, Santa Barbara,5 “social determinants of health are viewed as one of those extensions of traditional claims data that will allow us more accurately to identify patients for intervention.” Data on mortality and morbidity and socioeconomic and environmental data is often available in public records; one report notes that “useful data insights for care teams center on transportation, alcohol abuse, financial stability and food access”6 among many other issues.

**Insights From New Data Sources Focus on People, Not Just Diseases**

“For two-and-a-half-decades, in the healthcare field, we built predictive models targeting costs and utilization, using primarily claims and administrative data,” says Jonathan Weiner, a professor at Johns Hopkins University, Baltimore, and director of the Bloomberg School of Public Health’s Center for Population Health Information Technology. “But over the last few years, we’ve entered a brave new world where diverse big data is being collated and analyzed in an attempt to improve a dizzying array of factors in the health and healthcare domains. Not a week goes by that I and my colleagues aren’t presented with new possibilities to do good through analytics.”

> “Innovation is being driven in large part by the availability of new types of clinical, social and device data. Given their level of medical complexity and social need and the trajectory of the challenges, the opportunity to apply new analytic tools to the growing number of frail elderly will be significant.”

Medical data, including data from electronic health records and labs, is important as well, notes Swati Abbott, CEO at Blue Health Intelligence.5 “When we combine them in a usable way and in a timely manner, developing data to understand the person and not only the diseases the person may have,” she says, “we produce the most robust predictive analytics.” That’s what in-home monitoring helps accomplish when it’s provided by a data analytics partner that also has experience in connected health services for frail elderly populations; indeed, as Weiner adds, “innovation is being driven in large part by the availability of new types of clinical, social and device data. Given their level of medical complexity and social need and the trajectory of the challenges, the opportunity to apply new analytic tools to the growing number of frail elderly will be significant.”

Indeed, experts increasingly emphasize analyzing the complete spectrum of data provided by traditional sources – from claims and pharmacy records on one end to patient-reported vital signs on the other – and data provided by emerging sources, such as the activity change data generated by passive remote monitoring systems. Documented behavior alterations that could indicate something worth looking into – toileting and sleep habits are often early indicators, for example – can add important pieces to a patient’s data profile, often providing context to existing information; expert analysis can help caregivers focus on addressing problems immediately.
Remote Patient Monitoring ‘An Untapped Resource’

- “The US healthcare system could reduce its costs by nearly $200 billion during the next 25 years if remote monitoring tools were used routinely.”
- “Greater access to proven remote patient monitoring (RPM) technologies can lead to safer, more effective monitoring of older adults.”
- “RPM solutions represent an untapped resource for reducing costs and increasing quality of life.”

Those are three powerful statements from a Center for Technology and Aging position paper supporting “technologies that enhance independence and improve care for older adults;” one of them is RPM, which “uses digital technologies to collect health data from individuals in one location and electronically transmit it securely to a different location for assessment and recommendations.” That process can enable early intervention when, for example, sensors in the bedroom indicate that a patient got out of bed more often than usual, or not at all, guiding caregivers toward the right questions to ask – and act on – right away. Those “good catches,” when staff can clinically intervene before a patient gets sicker or needs to be hospitalized, can help lower costs and improve quality in many ways, in fact – including higher senior satisfaction. Patients’ trust is increased, and so is their feeling of connectedness.

Maximizing the benefits of in-home monitoring requires using the most appropriate technology platform.

Passive Remote Monitoring Provides Dependable Data

“Many types of remote heath monitoring technology require a senior to change her behavior – to remember to put on a wearable, or to take a measurement. And many in the senior market – especially the fragile dual eligible population – may be unable to fully comply,” notes Bryan Adams, chief commercial officer at GreatCall and the data scientist who developed the predictive analytics engine that powers the firm’s Lively Home solution. “Those technologies can’t ensure 100% compliance, leaving seniors at home without the full benefits of a monitoring solution.” His colleague, Sarah Jones, GreatCall’s vice president of client success, notes that “active remote health monitoring requires patients to participate in the daily measurement of blood pressure, pulse, weight and other metrics.”

There’s another solution, and its benefits are clear.

Passive monitoring works, according to Robin Felder, associate director of clinical chemistry and toxicology at the University of Virginia, because it doesn’t require “any thought or effort on behalf of the patient” to fully comply; indeed, she cites a Journal of Telemedicine and e-Health article showing a “staggering reduction” in costs for assisted living residents using passive remote monitoring. Recently, technological advances have allowed remote monitoring to extend beyond care facilities and into private residences. It’s a pretty simple set-up.
In-Home Monitoring Data & Predictive Analytics Create Insights

- 10 small sensors are placed throughout the home to gather data.
- No action by residents is required.
- Once the sensors have been put in place, residents go about their business as usual.
- The sensors monitor activity throughout the home – toileting, kitchen activity and bed loading and unloading – to detect significant changes in activities of daily living that may mean something’s amiss.
- A cellular hub provides connectivity to a central IT infrastructure, where an analytics engine aggregates and analyzes data trends to generate actionable insights.
- The essential information gleaned from the data is presented in a user-friendly format to care teams at separate locations.
- Care teams can initiate an appropriate intervention directly with the member.
- The lack of direct patient interaction with the sensors means 100% compliance.

Passive monitoring technology can alert care teams to psychological conditions that may pose problems, too. Alerts for restless sleep or activity overnight, for example, may indicate the onset of congestive heart failure or chronic obstructive pulmonary disease – or the onset of depression; expert analytics provide the context that helps caregivers focus their efforts. That kind of early interaction often improves the relationship between seniors and the people who care for them.

**Technology & Trends Meet: An Opportunity for MCOs**

The benefits – cost and quality – of passive remote monitoring have been carefully examined. They’re real.

- In a major study published in 2015,10 the University of Minnesota in Minneapolis’ Michael Finch PhD and colleagues installed “health and safety passive remote patient monitoring systems” in the homes of 268 dual eligibles; a case manager monitored their output and “proactively intervened when deviation from baseline behavior was detected.” After a year of claims data were gathered and analyzed to see how utilization and costs were affected, researchers saw “substantially reduced custodial care use, emergency department use, inpatient stays and emergency department costs compared to two control groups.”
• Noting that “Medicaid is the first large third-party payer to begin to formally reimburse passive remote monitoring technologies for the care of older adults,” a recent study added that the move is important “because these technologies’ potential for revolutionizing independent living is one of the most widely discussed topics in aging health studies.” The past decade, the research found, “has seen a high level of innovation in technology for aging, with numerous governments investing in significant research collaborations,” adding that “these technologies hold promise to safely supplement and reduce in-person care.” Citing multiple studies, the article added that “potential benefits of passive remote monitoring include reduced health service use, enhanced emergency response, fall detection, independence and postponement of institutionalization, feelings of security and peace of mind.”

Even before that, a conference paper touted the benefits of passive health status monitoring, pointing out in the abstract that it can “result in a statistically significant improvement in the perceived quality of life of the monitored older adults,” too; the researchers noted that that’s a function of “better quality of care, due to the availability of wellness reports to caregivers and an increased sense of security.” That study also found “an appreciable decrease” in physically and mentally unhealthy days after monitoring, “another indicator of potential improvement in the quality of care as a result of using the monitoring technology.” As well, the researchers reported, monitoring system data reports “can be useful in care coordination, care planning and early detection of health issues resulting from changes or anomalies in the data” and “may allow [care teams] to initiate appropriate and timely interventions that might not seem appropriate or necessary in the absence of monitoring data.”

A leader in providing the benefits of passive remote monitoring, GreatCall partners with MCOs looking to leverage technology to improve member services and lower costs — that’s a key attribute for MCOs serving the complex dual eligible market and the kind of advanced analytics that Medicaid directors often look for when establishing coverage options for that population.

Monitoring Service Lowers Costs & Improves Quality in MCO Setting

The 2017 study that validated the cost savings and quality improvement of passive remote monitoring was conducted at an MCO using GreatCall’s monitoring technology and predictive analytics. It confirmed that the cost savings from implementing remote patient monitoring systems suggest “an immediate value to health systems beyond the added safety of individuals.” By managing members’ health better, MCOs using GreatCall’s Lively Home can better manage their cost per member, explains Bryan Fuhr, the company’s vice president for Connected Health.
The delivery of a health note summarizing a change in a member’s ADLs allows the MCO’s care management team to provide the right level of care to the right member at the right time,” he says.

The remote monitoring technology “observes changes in daily activities that can result in health events related to the top five avoidable admission conditions,” Fuhr adds, “and proprietary analytics converts the information into actionable insights, often enabling timely intervention that can avoid further health complications. That’s vital information for managing risk, managing care and managing costs. MCOs can reduce avoidable hospital admissions and ER visits, and members can stay in their homes longer.” Importantly, access to patient data is secure. Log-in is required, and members choose who gets to see their information.

Monitoring Technology Makes the Most of Big Data

Health and safety monitoring services deliver valuable information that might not otherwise be captured, and GreatCall’s Lively Home system is deployed in populations with the highest utilization and risk stratifications — helping them live healthier lives and helping MCOs deliver higher quality at a lower cost. “Lively Home uses predictive analytics to proactively identify emerging health conditions faster,” Fuhr notes, “allowing MCOs to facilitate proactive, data-driven care decisions tailored to the needs of individual members.” It must work: 100% of MCO members in the 2017 study said they’d recommend Lively Home to a friend. And when asked how providing Lively Home affected their opinion of the plan, everybody they viewed it more favorably.

Technological advances that enable collection of vast new amounts of data on senior members in their homes meet consumers’ desire to live independently as long as possible — and they meet MCOs’ need to improve outcomes and lower costs for the often-difficult-to-care-for dual eligible population. Offering a passive in-home monitoring solution with an analytics engine that allows care teams to act quickly and cost-effectively on the insights the solution generates facilitates both longer-term in-home living and an emphasis on value — and it sets MCOs that offer it apart from their competitors. The technology is ideally suited for the rapidly changing economics and clinical mandates of connected senior care.
In-Home Monitoring Data & Predictive Analytics Create Insights...  

About GreatCall

GreatCall is the leader in connected health for active aging. Through its delivery of innovative remote monitoring and mobile urgent response solutions, GreatCall’s commercial business supports managed care, long-term care insurance, and senior living organizations in achieving the triple aim: improved health outcomes, reduced healthcare costs, and improved patient experience. Solutions include Lively Mobile with 5Star Services and Lively Home remote monitoring of activities of daily living with predictive analytics that deliver actionable insights.

To learn more, please visit https://healthcare.greatcall.com/

Sources:

3. “Comparing Population-Based Risk-Stratification Model Performance Using Demographic, Diagnosis and Medication Data Extracted from Outpatient Electronic Health Records Versus Administrative Claims.” Medical Care, 55(8), 789-796. DOI: 10.1097/MLR.0000000000000754.