IBM **Watson Health**™

Care management:
A new cognitive
paradigm

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As financial risk shifts from payers to providers, so is the focus of care management. Ten percent of the patient population generates about 70 percent of health costs.[1] So, healthcare delivery organizations concerned about value-based reimbursement must manage their high-cost population carefully.

Whereas call center-based care managers hired by health plans have traditionally taken the lead in this area, an increasing number of provider organizations now employ nurse care managers whose main task is to keep high-cost, high risk individuals healthier so they can stay out of the hospital. Primary care physicians are used to focusing on the clinical needs of the person during office visits; they may not have the experience or tools to help manage what the person does between visits to keep healthy. Electronic health record (EHR) systems, designed to manage medical records and activities during a hospital stay or visit, are inadequate for managing someone's care once they leave that delivery setting.

An ideal care management solution would not only be able to connect all the dots that constitute the determinants of health, but would also surface personalized insights that could enhance care and help activate individuals to self-management. Moreover, the ideal system would be able to scale care management, which tends to be labor intensive and costly, across an entire population.

This vision can be realized today because of advances in cognitive computing, a form of artificial intelligence that can meld and analyze many different types of data. Cognitive computing is well suited to the challenge of care management because of the myriad of differences among individuals and the diverse approaches required to support them in caring for themselves. In addition, the interlocking algorithms of cognitive computing are capable of learning over time. This ability to learn is essential to the new model of care management. It enables an organization to share the institutional knowledge of its best care managers with new or less-experienced team members. In effect, it helps ensure that the entire team follows and adheres to best practices while personalizing care at the same time.

This paper describes how an advanced care management solution combines personalized, evidence-based care management techniques with cognitive computing for a scalable, intelligent approach to care management.

A Shift in Focus

To help very sick or high risk individuals manage their conditions, care managers must have regular personal contact with them. As a result, care management is conducted mostly in-between clinical encounters. The Centers for Medicare and Medicaid (CMS) and private health plans are redesigning their payment models to incentivize this approach. Value-based reimbursement, whether in shared savings or capitation programs, can justify care management as a way to reduce medical costs.[2]

Individual engagement is critical to the success of care management, and vice versa. While not everyone can manage his or her own care, many people can be motivated to report on their health and improve their health behavior.[3] To effectively engage individuals, care managers must be able to personalize their care plans—and not only on the basis of medical factors. Care managers must also understand and be able to deal with psychosocial issues that have a major impact on both health status and health behavior.[4]

While care managers usually focus on high-risk individuals, the concept of care management could be extended to more of the population under management. Population health management solutions already automate outreach to those who are healthy and moderately ill with care gap alerts, appointment reminders and educational resources. With the help of cognitive computing, every member of a population could have a personalized care plan to maintain or improve their health. Health coaching could help people identified as pre-diabetics or pre-hypertensives avoid developing those conditions. By providing personal contact at key inflection points, care managers could cost-effectively manage a broader population.

The Role of Information Technology

The manual approach to care management—even if it focuses only on high-cost individuals—is time-intensive and costly, and it doesn't scale well in a large population. As in other aspects of population health management, the right health information technology is essential to ensure that all of the individuals who need care management receive it consistently.[5]

A software solution designed for care managers must aid them across a broad range of activities. Care managers need an application that helps them prioritize their work, gives them an overall summary of the person's health status, prepares them for assessment interviews, helps them develop care plans and track outcomes, and allows them to capture notes and communicate with other care team members. When combined with analytics and automation tools, such an application can provide powerful support for care managers.

With the help of new data aggregation and curation technologies, care management systems are poised to leverage data they have never had before in new ways. For example, it is possible to mine clinical, administrative, financial and social demographic data to glean personalized insights for more targeted care management. When care managers have access to this data from across care settings, this data can help them attain better insights, ask better questions and create better care plans for the individuals in their care.

Social Determinants of Health

Research has shown that only about ten percent of a person's health is determined by taking care of his or her clinical needs.[7] While some of what determines our health is genetic, most of what makes us healthy is determined by the other factors in our life. While American healthcare organizations are just starting to incorporate social determinants of health into care management, initiatives in Europe have shown the utility of this approach. For example, the Harrow Health Authority in London budgets a set sum for each eligible person's healthcare and the social services that support that care, such as transportation to medical offices. The health authority also has a registry of participating community service providers. Clinicians can use the registry to search for the providers who can deliver the requisite services at the best price.[8]

In the U.S., the ambulatory care manager is increasingly viewed as the hub of services provided to patients after hospitalization or between office visits. Right now, most of those services are medically related, such as the delivery of oxygen tanks and durable medical equipment to a person's home. But increasingly, social workers, housing experts and other non-clinical professionals are becoming part of the care team. So care managers will have to be concerned about social services as well as health care.

The care team is also expanding in other ways. The patient or member under management is, in fact, a member of the care team. The right tools to help individuals self-manage, such as mobile solutions that help them set goals and track their own activities, communicate with the care team and provide reminders, can greatly improve a people's engagement in their own care.

The expanded care team might also include a nutritionist, a home health nurse, a family member, a pharmacist, a social worker, and a clergyman. Meanwhile, the care manager will continue to coordinate care with the individual's primary care doctor and any specialists who are involved. By making it easy for the care team to communicate and providing more data transparency about the status of a person's overall health, care management can become more cost effective.

Intelligent Care Management

Traditional care management solutions were designed to support the health plan model of a case or disease manager in a call center. Legacy care management systems were designed for this model, which has had limited success given the health plan's role as payer of claims, not provider of services. As value-based care evolves, new solutions are needed that are designed for use by the care manager in the health care delivery organization where there is a trusted relationship between physician and patient, and the care manager can actually initiate interventions needed to close care gaps.

The goals of care management are fourfold[9]

1. Maintain or improve functional status
2. Increase capacity to self-manage conditions
3. Eliminate unnecessary clinical tests
4. Reduce the need for acute care services.

An intelligent care management system can support these goals with:

- Predictive analytics for efficient and accurate referral of individuals into care management programs
- Comprehensive information about the population
- Structured programs built in accordance with industry standard best practices in care management
- Efficient workflows
- Personalized insights derived from both structured and unstructured data using cognitive computing

Predictive analytics

It is important, from a cost efficiency perspective, to enroll in care management only those people who can benefit the most from it. Individuals who are already generating high costs will likely be referred to care management, but predictive analytics can also identify people who are at risk of becoming high cost and could be helped by enrollment in a care management program.

Preparing for encounters

Care managers help manage a person's health across the continuum of care, so they need information from multiple care settings to understand what has happened to the person and his or her current health risks. Regardless of its origin, this information needs to be accessed quickly and efficiently so that care managers can see an analysis of the latest information before they contact the individual.

Structured programs help care managers consistently adhere to best practices, yet provide the flexibility needed to create a personalized care plan. To prepare for an interview with an individual, an intelligent care management system can serve as a care mentor, providing insights that suggest narrowing down the possible questions from the hundreds of questions in the library. An intelligent system can provide suggestions for which assessments are needed, or which questions to ask, based on its analysis of the data. Over time it becomes a learning system, offering deeper insights based on experiences with similar individuals and care managers.

Workflow efficiency

The use of intuitive dashboards, a personal calendar and easy navigation through work flows are also important to cost effectively scale care management. Busy care managers with hundreds of people to manage need help prioritizing their day's work. Comprehensive information on each person in their panel gives them a holistic view of a person's health without having to dig for information in charts and other systems.

It is also important for supervisors to monitor care management performance. They need to efficiently manage staff capacity, including matching care managers to individuals in a way that will help the organization optimize care team effectiveness.

The Role of Cognitive Technology

The ability to create a system that can understand, reason, and learn over time offers a paradigm shift in the way care management is executed. Care management has traditionally been a labor-intensive process that becomes even more arduous and time-consuming when more complex health issues must be managed. Cognitive computing can help streamline this process.

Cognitive computing can draw deductions from searches of large data sets, and it learns continuously from the feedback it receives about its conclusions. Unlike static algorithms that are programmed to deal with particular kinds of information, cognitive computing uses overlapping algorithms that can accommodate types of data previously unknown to the system.

Natural language processing (NLP), which has been around for more than 50 years, has only recently become capable of understanding language in context with the help of cognitive computing.

The ability to search through text is important because about 80 percent of healthcare data is unstructured and unavailable to analytics.[11] Much of this data consists of free-text visit and case notes containing personal insights that cannot be gleaned from structured clinical data. Getting at this data can help a care manager connect dots about what is going on with an individual, barriers they are encountering or what motivates them that would otherwise be very difficult and time consuming to connect.

An intelligent care management system is one that uses a combination of cognitive technology, structured and unstructured data, assessment responses and evidence-based care guidelines to suggest personalized care plans for individuals. Care managers can flesh out these care plans, leverage system-derived knowledge and experience of other care managers on the team, experiences of similar patients, and insights to remove barriers and help a person attain their goals.

> In healthcare, IBM Watson's cognitive computing system has been used to relate insights from the medical literature with the genetic characteristics of individuals and their health conditions.[9] IBM Watson, for example, is able to search large amounts of text quickly to find matches of terms used in a query and rank them by confidence level with over 90 percent accuracy.[10]

Future of Care Management

Population health management analytics solutions will soon include data such as socioeconomic, physical environment, housing, working conditions, median neighborhood income, transportation, and social connections. Cognitive computing can analyze data on hundreds or even thousands of individuals who are similar to the person with whom the care manager is working. Cognitive computing could be useful to identify not only who is at risk for costly health issues, but who is most likely to be positively impacted by care management intervention. Additionally, cognitive computing could be helpful to physicians as they see, for example, common barriers to adhering to their standard treatment plan among patients with similar characteristics. As more information is derived from the care management process, these insights can feed back to the population health analytics that monitor performance and manage risk, providing a continuous loop of process improvement in quality, cost and patient or member experience.

For example, by looking at data on the care managers' processes and which assessments drive which outcomes, it could be possible to improve the assessments by sharing what information is already known and suggesting which questions need to be asked. A cognitive computing program that can analyze social determinants of health alongside other factors could likely predict the rising health risk of a person better than conventional risk models. In the long run, the same approach might enable the healthcare organization to reach out to people who are still healthy but at risk for developing serious chronic conditions, and offer low-cost services and tools to keep them from needing care management altogether.

Remote-monitoring data, whether from mobile devices or home monitoring equipment, is already being integrated with care management. Like physicians, however, care managers want only pertinent data that can be analyzed so that the data becomes actionable in their daily workflow. Cognitive computing can put this data into perspective by applying its knowledge of the individual's overall health, psychosocial factors and the medical literature to its insights.

Key Components of a Care Management Solution

A software solution designed for care managers must aid them across a broad range of activities.

- Helps them prioritize their work

- Gives them an overall summary of the person's health status

- Prepares them for assessment interviews

- Helps them develop care plans and track outcomes

- Allows them to capture notes and communicate with other care team members.

When combined with analytics and automation tools, such an application can provide powerful support for care managers.

Structured programs help care managers consistently adhere to best practices, yet provide the flexibility needed to create a personalized care plan. An intelligent care management system can:

- Serve as a care mentor as the care manager prepares for an interview with an individual

- Provide insights that suggest narrowing down the possible questions from hundreds of questions in the library

- Offer suggestions for which assessments are needed, or which questions to ask, based on its analysis of the data.

- Over time, become a learning system, offering deeper insights based on experiences with similar individuals and care managers

Conclusion

Nothing is more important to a care manager than having comprehensive, timely information about a person and the ability to act on it when engaging that individual to improve his or her health. But with hundreds of people to manage this can be a daunting task, so organizations need cost effective and scalable solutions to help.

The integration of structured programs, workflow tools and a learning system powered by cognitive insights is driving a paradigm shift in care management. By automating the routine tasks that are an essential part of care management, guiding care managers in the process, generating evidence-based, personalized care plans, and engaging individuals with self-management tools that make them an integral part of the care team, care management can go beyond just managing people with serious chronic illness, and intelligently manage a whole population in a cost-effective way.

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