

A. Significance

Problem Scope:

The estimated total avoidable medical cost in 2013 was \$213.2 billion, of which \$144.9 billion was due to Non-Adherence and Delayed Treatment costs. This number is a significant underestimate when you consider a disease such as diabetes, for which lifestyle is a significant factor in co-morbidity:

- More than 29.1 million people in the United States have diabetes, including an undiagnosed population estimated at 8.1 million.
- Yearly cost of diabetes care has been estimated to be \$116 billion, plus an additional \$58 billion for indirect costs including disability, work loss, and premature mortality on intrinsic motivation.

Unmet Need

The goal of Population Health Management (PHM) is to keep a patient population as healthy as possible by minimizing the need for expensive interventions such as emergency room visits, hospitalizations etc. PHM will lower costs, as well as redefine healthcare as an activity that encompasses more than sick care.

While PHM typically focuses on the high-risk patients who generate the majority of health costs, it will also systematically address the preventive and chronic care needs of every patient.

Accountable Care Organizations (ACOs) have been proposed as the solution to implementing PHM but they have yet to create a significant change. Through the role of a care coordinator, an ACO is designed to statistically determine the most cost effective manner of treating a specific population, and to help each patient implement their own treatment plan. However, this is a difficult task for a care coordinator who may be responsible for more than 1,500 patients. As a result, ACOs are really only targeting "delayed evidence-based treatment practice". However, even in this domain, the ACOs have only shown a marginal improvement.

In reality, there will never be enough human care coordinators to provide the level of interaction necessary do the job effectively. Inevitably, the position of a human health care coordinator will be replaced with a digital health care coordinator (DHCC) that can achieve population management objectives and at the same time provide the individualized care and attention patients need. The DHCC will ensure that the patient's care team is aware of clinically relevant events while working with the patient to support unmet needs and interceding before issues rise to clinical levels.

B. Innovation

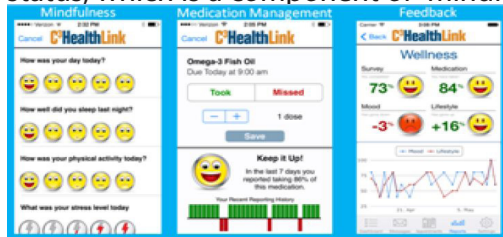
Problem Scope:

IntelliSanté Inc. has been working towards creating a complete smart health system, capable of supporting PHM by a human health care coordinator, as well as a DHCC, capable of issuing two levels of alerts: clinical and early intervention events. Not only will the DHCC simply issue alerts, but it will take action by suggesting non-prescriptive clinically accepted intervention strategies. It will also, through implementing the principles of "mindfulness," assist the patient in taking charge of their own physical and mental well being. For example, the patient's emotional stress level or sleep pattern may not be active areas of support by the human members of a patient's clinical team, but are known to be important in modifying the factors that make people sick or exacerbate their illnesses. It is estimated that up to one-third of individuals with a serious medical condition experience symptoms of depression. As a result, the presence of a depressive disorder is two to three times more common in people with a chronic disease.

IntelliSanté has created a user friendly patient centric mobile/web application called C3 HealthLink. C3 HealthLink

monitors everything from weight loss to mental health including medical conditions such as depression and seizure disorders.

The patient also answers a daily patient survey that can be used to track the variability of their mental and physical status, which is a component of “mindfulness” (the awareness of variability), as well as share information with the

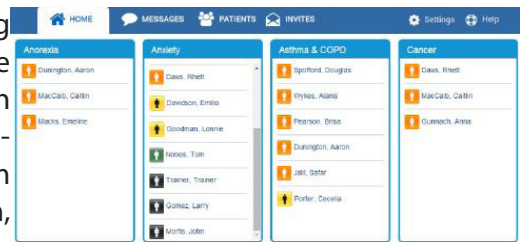


team members (clinicians and family members) that the patient has invited to view their data. Unlike other systems, the patient rather than the clinician is in complete control over who sees their information.

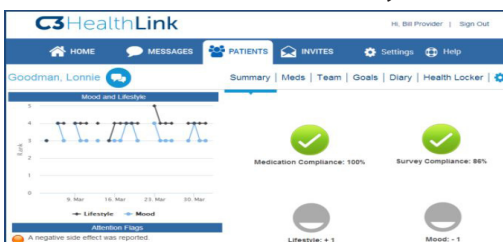
On the PHM side, intelliSante’ is currently in beta testing with its team portal. Unlike typical provider centric systems, a human care coordinator can only see information which patients give them access to. An additional

feature is that the patient rather than the clinician selects the populations that they want associated with them.

For PHM, a team member can quickly see, based on the patent pending color-coded system, which patients within a population need immediate attention, and will receive a HIPPA compliant email/text associated with that alert. While viewing a patient record, the team member can see summary information, review medications, communicate with other team members as well as the patient; view patient goals and diary information, and view the patient’s health locker.



At the bottom left corner of the summary screen is an attention flag, representing a clinical alert that was generated, based on the patent pending alert system. The alert system takes into account not only the rate of change of data, but also screens diary entrees for danger words/phrases like “suicide” or “hurt myself” as well as lower



level words like “crappy”. The C3HealthLink is an incredibly popular tool for both patients and their teams and its patient centric focus is unique in the industry. However, as powerful as it is, it is still dependent on a human team member to provide the intervention. Unfortunately, in the case of depression associated with a medical diagnosis, there may not be a clinical team member following this issue and providing interventions. This missing element is exactly why this proposal seeks to pilot a digital health care

coordinator/DHCC: To bridge the gap by assisting the patient in taking control of their own health!

C. Approach

The results of more than three decades of research have shown the many positive effects that “mindfulness” can have on health, improving quality of life both in the general population and in clinical populations. Specifically, with respect to chronic illness, “a mindless view of the symptoms and of the diagnosis increases the suffering experienced, while improving the mindfulness of individuals with chronic illness will help to increase psychological well-being and quality of life.”

Our overall approach is to implement, within a mobile application useable by a patient, a DHCC that uses the principles of “mindfulness”, specifically “Langerian Mindfulness” to help the patient take control of their own mental and physical well-being.

Within the western world, two major theoretical frameworks defining mindfulness were developed in the 1970’s, one by Jon Kabat-Zinn and the other by Ellen Langer. In Jon Kabat-Zinn’s theory, mindfulness focuses on paying attention to the present moment non-judgmentally, and requires the use of meditation. In contrast, Langer’s concept of mindfulness does not mandate the use of meditation in order to experience increased mindfulness. Instead, it is characterized by the process of actively making new distinctions about a situation and paying attention to the subtle variation in life by recognizing that the world is constantly changing. In the case of psychological or physical suffering, what makes a mindful perspective so powerful is that it helps one to understand that negative

feelings, whether psychological or physical, are not always present, and that an awareness of the variation in the intensity of those feelings may result in mitigation of symptoms.

Using “Langerian Mindfulness”, health care practitioners can help the patient redefine the world with more possibilities than simply the experience of being a patient, regardless of how they have been labeled by others in and outside of the medical profession. This assistance is provided by helping the patient to pay attention to variability; seek and produce novelty; understand that many, if not most, events can be viewed as both positive and negative; accept and play with unpredictability; make sense of symptoms and add humor.

Our specific approach, to the extent possible, is to implement the suggestions above within the C3HealthLink system using a digital health care coordinator/DHCC, with the primary focus of paying attention to variability.

The goal of typical clinical practice is to stabilize the patient. However, in mindfulness, stability represents an acceptance of one’s condition and is seen as not only an undesirable state but an opportunity to take control by paying attention to variability. Therefore, while C3HealthLink will continue to implement clinically significant alerts, the DHCC will also be configured to issue alerts and intervention strategies also based upon stability, which is a completely novel and innovative approach to healthcare, since current clinical models assumes their job is done when stability is achieved.

To this end, our plan is to implement not just clinical alerts based upon the rate of change, which is a purely medical model, but to also include early intervention alerts, which include alerts based upon stability (a mindfulness model).

For all types of alerts, the DHCC, will be able to provide mindfulness interventions such as asking the patient one or more of the following “mindfulness” based questions: - What are some other things that might be causing this change you are experiencing, that are unrelated to your diagnosis? - Everything has both negative and positive aspects, what are some of the positive aspects of the changes that you are experiencing? - Why is today different than yesterday or last week?

An additional form of mindfulness intervention would provide recommendations about clinically accepted intervention that a patient might implement on their own. The goal being to present at least two or more unique/novel intervention strategies that the individual can select. The ability to select from unique intervention strategies promotes the “mindfulness” concept of exploring novelty and helps the individual take a level control over their own health, rather than being dependent on a clinician.

With respect to early intervention alerts based upon stability, in addition to doing one or more of the above, the patient will be given the option of increasing the level of discrimination, such that variations can be monitored. For instance, instead of just using a 5 point Likert scale the patient will also have a sliding scale bar underneath it so that they can differentiate between a 3.2 reading that they had yesterday and a 3.1 reading that they have today. In fact, it is planned that sliding bar will actually have an indicator line representing one or more readings of where the patient was yesterday, last week or last month. By including this information, the patient will be increasingly mindful of the variations in their mental and physical well-being and improve their outcomes.



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Founded in 2010, intelliSanté is a patient-centric, medical informatics company focused on developing applications and web-based tools that improve health and wellness. The company is on the forefront of developing software products that provide a personal, secure environment through which users can control their personal health data and communicate with trusted healthcare providers and caregivers, all in a HIPAA-secure environment.

With Intellisante’s suite of Consumer Centric Communications cloud-based software applications, the company is positioned to take advantage of the rapidly evolving environment in U.S. healthcare. C3HealthLink is a patient-centric health data and communications system, C3Interact is an organization-controlled enterprise platform for application development, and C3Knowledge Exchange is the analytics and data solutions arm of the company.

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