



The Computerworld Honors Program

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Final Copy of Case Study

Status:

Laureate

Year:

2013

Organization Name:

Continuum Health Partners, Inc.

Organization URL:

www.wehealny.org

Project Name:

Improving Patient Outcomes through Predictive Analytics

Please select the category in which you are submitting your entry:

Mobile Access

Please provide an overview of the nominated project. Describe the problem it was intended to solve, the technology or approach used, how it was innovative and any technical or other challenges that had to be overcome for successful implementation and adoption. (In 300 words or less)

Continuum Health Partners, Inc. has made consistent strides and efforts to provide the highest quality of care, including excelling at federally mandated health outcome goals. Despite large educational sessions, embedding workflows into the technology, and utilizing pay for performance, these outcome goals have remained elusive. Documentation, or lack thereof, has been the most consistent challenge discovered. Embedded in this is the nature of siloed data in healthcare, which makes complex, multi-problem patients extremely difficult to diagnose correctly in an efficient and accurate manner. Another challenge was the complexity surrounding multiple providers needing the same information available simultaneously so efficient care could be initiated ahead of adverse

events. This logically also demanded the data be available on mobile devices. Process Proxy Healthcare Smartgridm helps clinical care providers predict, profile, and identify complex patients during their time of stay that require timely clinical interventions, and additionally identify patients not classified correctly upon admission. It does this by accepting data feeds in a high number of formats, including natural language processing and machine learning, and providing predictive analytical reports based on clinical outcome goals. By utilizing Process Proxy SmartGrid, clinical care providers have engineered an automatic patient profile that identifies, in advance, a list of items that must be checked and addressed for a targeted set of patients. By applying "micro-targeting," specialized teams that use different early clinical care interventions can be applied where needed, before adverse clinical outcomes occur. The Healthcare Smartgridm Intervention Lead Time Analysis (ILTA) can give clinical care providers the ability to predict with a high percentage of accuracy patients with a particular disease or condition. This data is available real time and available on mobile devices.

When was this project implemented or last updated? (Please specify month and year.) Has it incorporated new technologies and/or other innovations since its initial deployment? (In 300 words or less)

The project was started in October of 2011 with first productive use in July 2012. There were a variety of innovative aspects to this project. a. Use of Cognitive Capacity Management to better manage multitasking and decision fatigue, thereby significantly improving performance and patient safety, all while ensuring significant human / physical resources would not need to be added to accomplish the greater workload facing the healthcare industry with increasing patients of greater complexity. b. Use of process mining, predictive modeling, and tele-health with analytics applied to patient care and health care outcomes. This application of natural language processing and machine learning used by the Smartgrid has patents pending. c. Use of technology originally designed for the Department of Defense (both by the Defense Advanced Research Projects Agency, or DARPA, and now funded by TATRC) to better utilize resources and maximize execution of their tasks. Bringing this technology to healthcare, realizing staff all have tasks to accomplish, is a very unique utilization of this technology. The focus is not on staffing ratios and the right amount of staff with a particular skill; the focus is utilizing staff and skill levels to accomplish better health care outcomes for a patient. Rather than do a random chart review, efforts are focused on patients who will most likely have a particular condition. d. Multiple real time data streams are pruned to filter unneeded data points, based on machine learning, to streamline processing and provide near real time predictive analytics.

Is implementation of the project complete? If no, please describe the project's phases and which phase the project is now in. (In 300 words or less.)

The implementation of the original statement of work was complete October 2012. However, the clinical use of this application and process was such a huge success, that we added on phases to add more clinical use cases to the workflow. The original 4 use cases have each improved clinical outcomes by over 8 - 15%. We are adding further use cases (infection, pressure ulcers, bed sores, and other quality initiatives). The impact of real time, while the patient is still in the hospital, predictive analytics has had a huge impact on patient outcomes. We are currently testing a way to alert a provider, via mobile alert, of a patient who is about to be discharged and needs a final validation of care being given.

Please provide at least one example of how the technology project has benefited a specific individual or organization. Feel free to include personal quotes from individuals who have directly benefited from the work. (In 300 words or less.)

CHP has experienced a strongly positive operational impact to the workflow to support quality initiatives, patient care, and concurrent documentation. Real time interaction between the patient and clinician, while the patient is still admitted, has generated a higher degree of complete documentation of care provided, but more importantly, avoiding adverse outcomes as evidenced by the improved documented outcome goals. The clinician and quality assurance department no longer have to complete retrospective review of patient care; they now educate clinicians and patients on the spot, allowing for better key indicator compliance, as well as intervening before mistakes of care omission occur. The initial four use cases have all improved compliance rates of 8-15%. The customers in this project are defined as the patient, clinicians, and the quality assurance (QA) department. The QA department is now empowered with real time data on the care of high risk patients. This has streamlined their workflow, allowing more time on other quality initiatives. The focus of their work is no longer justifying why care wasn't given in a particular way, but real time interventions. As an example, a patient admitted as a "pneumonia" diagnosis was identified via SmartGrid as a high probable for Congestive Heart Failure. The heart failure team, upon receiving this data, visited and examined the patient, determining that the patient was indeed likely to have a heart failure. The treatment for this patient was modified, adverse events avoided, hospital stay was decreased, and the best after hospital care arranged. This scenario has been repeated thousands of time since this project went live. As one heart failure team nurse stated, "This data is almost too good to be true. These are patients who previously slipped through unnoticed until a failure occurred. Now we can prevent instead of treat."



Would this project be considered an innovation, a best practice or other notable advancement that could be adopted by or tailored for other organizations and uses? If yes, please describe that here. (In 300 words or less.)

This project can be considered an innovation, as well as a best practice. The service has been provided to multiple clients in prior, less sophisticated forms. The new Smartgrid is being considered for helping the Defense Department define the use cases and benefits of a next generation clinical resource optimization tool, given the Smartgrid's emphasis on managing cognitive capacity optimally and thus maximizing task execution. The project is being funded by the Telemedicine and Advanced Technology Research Center (TATRC) for a cooperative of facilities. Our partnership with Process Proxy thus includes being a part of this consortium of medical centers. Each medical center has its own goals and initiatives, as well as initiatives that span across the medical centers. Optimization of processes, workflows, technology, and ultimately sharing the lessons learned with other cooperative members as well as with the Military Health System has been a great model. We are already learning and sharing best practices with other medical centers, and by having a consortium where the utilization and development of new technology can be openly discussed and ideas shared has been wonderful. This has had the effect of accelerating innovation and outcome improvements for all of the participating hospitals.

If there are any other details that the judges should know about this project, please note them here. (In 300 words or less.)

There has been a surprising and unexpected benefit to this project. By introducing a fast return of the investment of changing workflow, originally perceived as "additional work", the culture has begun to change. Clinicians have always been willing to improve and undertake efforts to improve patient care, but traditional efforts have always been sourced in a slower review of forensic data to develop approaches to future treatments. This project has opened eyes, perhaps previously shut, to the power of real time predictive analytics, and the role they can directly play to a better patient experience, and better clinical outcomes. That is a major reason why in many ways this project will never end, only have a series of new initiatives, new clinical goals, and new quality aims. This project has become the fuel of constant quality improvement efforts. It has accelerated our path to achieve these goals, as well as expand what is possible.