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# Abstract

To continue to receive incentives and to avoid possible future fees MediCorp continues to strive to meet or exceed all requirements presented by Meaningful Use, a medical policy. One of many requirements is to provide patients unlimited access to basic health information including the latest test results, lists of prescription medicines, and current conditions. In order to qualify, MediCorp must show that this service is being provided. The measure by which this is done is based on the percentage of patients cared for by MediCorp that are currently registered for the patient portal. Through alterations to current processes and procedures MediCorp strives to promote the portal by showing patients the benefits of registering for the portal. Analysis provided in this study, for one possible process improvement, shows indicators to look for that will show if a newly designed process is actually making an impact on portal registrations.

# Acknowledgements

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# Chapter I: Introduction

Recent legislation authorized by the American Recovery and Reinvestment Act signed by President Obama in January, 2009, has instated a medical policy known as Meaningful Use. On July 13, 2010 the Meaningful Use Final Ruling was officially published and a three stage process was laid out for medical organizations to adhere to. Organizations have two years to complete each stage. The basis of Meaningful Use is that Health Care Organizations must begin utilizing a certified Electronic Health Record. However, besides having an Electronic Health Record system in place, the organization must meet specific standards that indicate the system is being used by patients. Examples of the standards: are the ability to generate lists of patients by condition, submit electronic immunization data, store lab results as structured data, and provide patients with timely electronic access to medical records.

Meaningful Use requirements are maintained and enforced by Centers for Medicare and Medicaid Services. Centers for Medicare and Medicaid Services, a sub-division of the Department of Health and Human Services, was put into place in July 1965 by President Lyndon B. Johnson. From that point forward Centers for Medicare and Medicaid Services has managed and regulated Medicare and Medicaid programs. Meaningful Use is the latest regulation that Centers for Medicare and Medicaid Services began overseeing. Continuing with the premise that Medicaid and Medicare programs serve to enable those who cannot afford medical care otherwise to receive the care they need, Meaningful Use sought to enhance the care provided by health organizations.

For the benefit of the health organization, incentives are part of the program and available for health organizations to receive if certain requirements are met. To meet these requirements health organizations are required to put processes and procedures in place to improve the collection, use, and portability of health information. With these processes and procedures in place, health organizations would be able to provide improved care for all patients; especially for those covered by the Medicare and Medicaid programs. Some of the core requirements for healthcare organizations to meet under Meaningful Use are: e-prescribing, maintain an active medications list, and displaying the capability to exchange key clinical information. A full list of requirements within the umbrella of the new Meaningful Use law is included in Appendix A.

A healthcare center wishing to remain anonymous, hereafter referred to as MediCorp, was a healthcare system established in the upper mid-west. Though MediCorp has typically served smaller rural areas, the organization has been a leader in technological innovations. MediCorp was ahead of its time and far ahead of the Electronic Health Record curve in many ways, utilizing technology to better serve patients since the late 1980's. From the mid-1990's, the homegrown software and Electronic Health Record System that MediCorp developed already included most of the requirements newly required by law for storing and submitting medical data.

The one element that had been lacking in MediCorp's software though, was the ability to allow patients to have timely access to their own medical records. The infrastructure that allowed access to patients at will was already in place as it was currently possible for patients to log into a patient portal to request appointments and see some of the latest general lab results like hemoglobin levels, height and weight, and blood pressure. When Meaningful Use became part of federal legislation however, it became a necessity to enhance this portal and prove its patron usage. More information needed to be made available such as: post-visit summaries, medication lists, and more timely access to current test results. In addition, it was required to show that the portal was actually being used by patients to meet the standard of providing patients timely electronic access to medical records.

The portal, as of the start of this study, met all standards regarding the type and availability of information. What lacked were the numbers that proved adequate usage. The small clinic setting was chosen to pilot new methods for promoting the existing Patient Portal. The original plan by MediCorp was to simply display literature identifying the usefulness of the portal. This did increase inquiries and the number of patients that enrolled to utilize the portal. However, numbers were still not at MediCorp's goal and the percentage of patients utilizing the portal became stagnant.

## Statement of the Problem

MediCorp's medical staff needed to increase awareness of and assist patients in registering for the patient portal. As of September 2012, MediCorp had 27.5% of members seen at the Menomonie location listed as actively utilizing the MediCorp Patient Portal. System wide, MediCorp had a goal for 35% of all patients to be actively registered for the portal. MediCorp's Menomonie location manager decided to attempt to exceed the goal. Having observed the percentage increase of 10% over the past six months, the site manager set a goal to reach 37.5% of all patients seen to be actively enrolled in the portal by April 2013.

## Purpose of the Study

The goal of this study was to establish a process that providers and other medical staff could use to increase patient awareness and register patients for the portal. A major factor the process needed to focus on was to ensure the process had minimal effects on normal workflow and did not increase the length of an office visit. As part of this established process, measurements were developed to assist MediCorp in validating the efforts put into educating patients about the portal.

Because future implementations of Meaningful Use suggested that incentives eventually will be converted to fines for non-compliance, the bottom line was that MediCorp needed to be able to show a proper percentage of patients were registered for the patient portal. Currently proof was required for MediCorp to receive incentives from Centers for Medicare and Medicaid Services and these incentives were MediCorp's motivation to comply.

## Assumptions of the Study

The basic assumption throughout this study was that the portal already provided an adequate amount of information. There was also the assumption that medical information was made available for access via the portal in a reasonable amount of time. The last assumption was that it was secure for a provider to assist patients to setup their usernames and passwords for initial registration.

## Definition of Terms

**Electronic Health Record.** A digital version of a paper chart that contains all of a patient's medical history from one practice (Department of Health and Human Services, n.d.).

**Web Portal.** "A doorway that can be customized by individual users to automatically filter information from the Web." (Zhou, 2003, p. 120)

**Patient Portal.** A website setup to provide patients electronic access to information found in their Electronic Health Record (eClinicWorks, 2013).

**Rooming Process.** The process in which a nurse or medical assistant moves a patient from the waiting room into the exam room in preparation for meeting with a doctor.

## Limitations of the Study

One major limitation of this study was the ability to observe the process of a patient setting up log in information first hand. This limitation was due to the researcher not being directly part of the medical staff for MediCorp and observing the process could potentially violate the Health Information Privacy and Accountability Act, which limits handling and viewing of patient medical records to medical professionals and staff as needed (Health Information Privacy, 2012). Any issues with the process were noted on a secondhand basis of what medical providers said about the process. Another limitation was the number and type of patients seen at the small practice used to pilot the new process. If all patients seen during the study were already setup with the patient portal, then it would remain undetermined if the process saved any time or increased patient portal users.

The study's results apply only to the specific facility studied and time the study was completed in, due to factors that cannot be replicated. Irreproducible factors include the current patient population and demographic makeup as well as current staff. The portal itself also changes overtime, so this study was limited to results for MediCorp's portal as it existed. Any improvements or changes to the portal would have to be evaluated on their own as possible causes for improved registration numbers. Measurements from this study may still apply, but the raw data and specific results of this study cannot be used to infer the effects of any other change or process improvement on new portal enrollment levels.

## Methodology

The historic significance of Patient Portals will be investigated. Then a brief look into what MediCorp was doing to make patients aware of the portal to increase utilization will be examined. Finally analysis will be completed to investigate what methods seem to help patients realize the benefits of utilizing the portal. To determine which method was best, the percentage of patients signed up for the portal will be measured.

The study was initiated with a brainstorming session with the clinic's manager which lead to the organization of a focus group that developed a preliminary plan for promoting the Patient Portal. New measurements to supplement MediCorp's basic cumulative percent of patient actively enrolled in the portal were developed to help indicate small improvements over a shorter amount of time.

The primary measurement that MediCorp focused on when determining the utilization level of the Patient Portal was based on a percentage of patients seen by a MediCorp provider that also had registered for MediCorp's Patient Portal. The measurement was further defined as all patients seen within the past year and were reviewed to verify the number that have or have not registered on the portal.

Data analysis tools available within Microsoft Excel including: t-tests, correlation, and regression were utilized to determine if there were any improvements and what may have caused them. To compare time periods and verify improvements t-tests were utilized. Chosen over the similar z-test because of limited data elements to compare, less than thirty, the t-test compared the average number of new enrollments by month for each selected period in time. A p-value was calculated with a significance level of 0.05. If the observed p-value was between 0 and 0.05 then it would be concluded that any difference in the averages was meaningful; if the average rose for the period after implementing the onsite registration with desired significance it would be concluded that the new process was the reason.

The other test utilized from the Microsoft Excel data analysis package was a test of significant correlation. Correlation was calculated to see if it was positive or negative. Then the regression test was executed against the data set to determine if the correlation was significant. Significance for correlation was measured on a standard 95% confidence interval. Correlation was checked to observe how the rise and fall of the number of pin numbers issued or the number of pin numbers expired would indicate a rise and fall of new enrollments by month. Again, a p-value was calculated here to determine significance of any noted correlation. Expectations of the results of this test were to find significant positive correlation. These results would indicate with confidence that if the number of pin numbers issued each month could be increased then the number of new enrollments would increase.

With these objective measures MediCorp was able to accurately determine if new methods were working or if one method worked better than the next to increase the number of new monthly enrollments. The process of formulating the new or improved process was a bit subjective and came about through the use of focus groups. In addition to the focus group, regular feedback was garnered from the staff to verify what they thought of the new process. The full circle approach, utilizing both objective tests and the subjective feelings of the process by the staff, allowed MediCorp to find a method to increase portal registrations that proved to be effective in terms of results and sustainable in terms of staff satisfaction.

## Summary

The study of how to generate greater rates of portal registrations concluded after a series of t-tests, correlation tests, and regression tests within Microsoft Excel were used to evaluate the raw results found by counting data. Data included the number of pin numbers issued, the number that expired, the number of patient office visits, and the number of new portal registrations. The study reviewed the Federal Law that mandates the use of a patient portal as well as the history of portals and patient communication methods.

# Chapter II: Literature Review

Ensuring patient utilization of the patient portal is not in and of itself required by or a directive of Federal Law. MediCorp as an organization believed strongly in the initiative to increase the number of patients that utilized the portal. To understand the decision and justify the large sums of money invested to develop patient portal technology, it is important to analyze the background. There were many forces that helped drive MediCorp to put together the patient portal that exists today. First and foremost was the foresight that identified the future direction of industry and government. Today there are many laws that govern the usage of patient portals and how the portals must work. There is also competition among health care organizations to provide the best possible care. Part of that care is providing patients access to medical information and health records. In the next few sections three areas will be reviewed: laws governing patient portals, platforms and technology used, and what parts of the Electronic Health Record can be made available.

## Laws

**Health Information Technology for Economic and Clinical Health.** Under the American Recovery and Reinvestment Act, the Health Information Technology for Economic and Clinical Health Act was created (Adler-Milstein, Bates, & Jha, 2011). Health Information Technology for Economic and Clinical Health authorized $30 billion to enhance and broaden usage of an Electronic Health Record (EHR) (Adler-Milstein, Bates, & Jha, 2011). In order to receive the incentives, medical providers and organizations were given a set of core criteria and menu criteria to be met. The objectives were laid out in a series of three stages (Jha, Burke, DesRoches, Joshi, Kralove & Campbell, 2011). The establishment of these standards started an era that would lead to required meaningful use of Electronic Health Records and interoperable

Health Information Technology. The end goal was that regardless of where a patient sought medical attention it would be possible for the organization to retrieve basic medical history for that patient, from any and all possible sources.

The development of the standards and criteria as well as the monetary reimbursement programs was left in the hands of several Department of Health and Human Services agencies. Centers for Medicare and Medicaid Services put together a program that tied the incentive dollars set aside by Congress to reimbursements, so providers could receive for services provided to Medicaid and Medicare patients (Department of Health and Human Services, n.d.). In July 2010 Centers for Medicare and Medicaid Services finally released this final rule as the Medicare and Medicaid Programs' Electronic Health Record Incentive Program. In conjunction with the incentives program developed by Centers for Medicare and Medicaid Services, the Office of the National Coordinator for Health Information Technology went to work to develop the standards, implementation specifications, and Electronic Health Record certification criteria (Department of Health and Human Services, n.d.). Also in July 2010 after the release of these standards Office of the National Coordinator for Health Information Technology, which was originally developed by Executive Order in 2004, become an agency written into law with the Health Information Technology for Economic and Clinical Health Act (Department of Health and Human Services, n.d.). Figure 1 shows the relationship between Centers for Medicare and Medicaid Services and Office of the National Coordinator for Health Information Technology. Shown in this relationship is that the Office of the National Coordinator for Health Information Technology is responsible for what an Electronic Health Record should be able to do while Centers for Medicare and Medicaid Services defined how it needed to work (Henricks, 2011). Both criteria must be satisfied in order for a provider to receive any incentive money. Eventually, when the incentives run out, the requirements will need to be met to avoid financial penalties that would be imposed in the future.

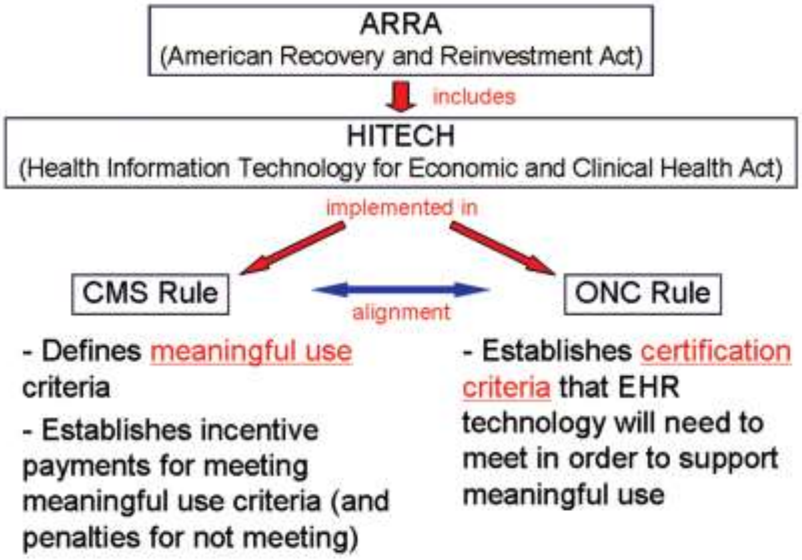

*Figure 1:* Relationships among ARRA, HITECH, and Final Rules. Adapted from ""Meaningful use" of electronic health records and its relevance to laboratories and pathologists." By Henricks, W. H., 2011, *Journal of Pathology Informatics, 2(1)*, pp. 36-49. doi:10.4103/2153-3539.76733

**Meaningful Use.** Meaningful Use is defined by a series of stages and is over seen by the Health Information Technology for Economic and Clinical Health Act. Stages one and two have been defined for compliance in the years 2011 and 2013 respectively. Drafts of Stage Three requirements have been made public for healthcare centers to start planning, but official requirements will be released in 2014 (Department of Health and Human Services, n.d.). The Health Information Technology for Economic and Clinical Health Act has put out requirements which Centers for Medicare and Medicaid Services and Office of the National Coordinator for Health Information Technology have used to establish standards (Henricks, 2011, p. 38). The provider must use certified Electronic Health Record technology:

- "in a meaningful manner (e.g. e-prescribing)" (Henricks, 2011, p. 38).
- "in a manner that provides for electronic exchange of health information to improve the

quality of care" (Henricks, 2011, p. 38).

- "to submit clinical quality measures and other measures determined by the Department of Health and Human Services Secretary" (Henricks, 2011, p. 38).

The first stage set forth by Centers for Medicare and Medicaid Services focused more on efficient storage and transferability of health information. Stage One was to be in place by 2011. Requirements for Stage Two were released early in 2012 and will be enforced by 2013. Stage Two built upon what was already required in Stage One, with guidelines becoming more stringent. Stage One encompassed a list of fifteen core objectives that required information to be stored electronically and fourteen menu objectives that required information to be viewable at a glance by medical staff (Department of Health and Human Services, n.d.). A diagram of each of the defined requirements for each stage is included in Appendix A: Meaningful Use Stages. For Stage One online access was not required. Moving in the direction of online access and the requirement of a portal are the main objectives from Stage One. Stage One core objectives require that the healthcare center:

- provide patients with an electronic copy of their health information, upon request.
- provide clinical summaries for patients for each office visit.
- maintain up-to-date lists of current and active diagnoses and conditions.
- maintain an active medication list.
- maintain an active medication allergy list.
- record and track changes in vital signs.

Stage Two requirements expanded upon Stage One. Stage Two requirements included seventeen core objectives and six menu objectives (Department of Health and Human Services, n.d.) In Stage Two, online access is called out as a requirement and a means of displaying many of the data that were stored as part of Stage One. Specific core objectives from Stage Two were for the healthcare center to:

- allow patients to view online, view their health information within four business days of the results being available.
- provide summaries for each office visit.
- protect and maintain health information using appropriate technological means.
- establish lists of patients by condition to for quality improvement, reduction of disparities, research, or outreach.

Electronic Health Records were to be more functional and health systems' data needed to be more interoperable. Expecting that the first two stages would help make health systems more efficient, stage three requirements are speculated to be related to improving individual and population based patient outcomes. Stage three requirements are expected to, "include greater use of decision support tools and patient access to self-management tools" (Henricks, 2011, p. 38). The stages contain guidelines that are hard to meet, but the incentive is high. A provider using certified Electronic Health Record technology could accumulate $44,000 in incentives (Jha et al, 2011; Henricks, 2011).

Health Information Technology for Economic and Clinical Health has provisions involving security of patient information and confidentiality. These provisions are built on the bases of earlier legislature from 1996, the Health Insurance Portability and Accountability Act (Department of Health and Human Services, n.d.). With advancing technology, provisions were included in Health Information Privacy and Accountability Act to protect individual's identifiable health information. Among securing health information Health Information Privacy and Accountability Act was the beginning of defined code sets and transactions that would start to allow medical information to be portable electronically. Department of Health and Human Services (n.d.) took the statutes defined by Health Information Privacy and Accountability Act and published the final Privacy Rule late in 2000. Compliance with the ruling was mandated by April 2003. A Security Ruling was also released by Department of Health and Human Services. Health care organizations were to comply with this ruling by April 2005.

## The Portal

**In the beginning.** For savvy internet users of today it is not uncommon that the first thing that happens once their preferred web browser is open is that they immediately log into an account of some type. Whether it be driven by one of the current main stream search engines Google, Yahoo, AOL, etc., or not information starts streaming and becoming available at the user's finger tips. A swift click of the mouse or tap of the screen and deeper into the web the user dives. This is not how the web has always worked though. It has taken many years to get to the point where the basic web browser knows what the users want to see almost before the users even realizes what they are looking for.

Some of the earliest known portals came into existence in public libraries with digital versions of Index Medicus (Zhou, 2003). Though crude by today's standards of searching in terms of usability and speed, by definition, these portals made it possible for users to view search results of the index to locate new information or to verify the existence of pieces of specific information. In business, portals began becoming available for employee use within larger corporations (Overview of Portals, 2002). Powered by vendors such as Oracle and PlumTree, portals were utilized to access corporate information from multiple computer systems. In the late 1990's as web and internet technology progressed so did that of the portal. The basis for today's portals became part of the web. Though many of the webpages of that time contained static information, it was still possible for a user to bring up a browser and search by category to locate and view desired information (Zhou, 2003). Jetnet in cooperation with American Airlines was one of the pioneers that sought to get the most from the expanding web technology (Roberts, 2003). Rather than simply having a web portal that worked on the American Airlines' internal network an employee portal was developed and made available on the internet. By doing so American Airlines was able to dramatically reduce costs simply by having a one-stop-shop, web portal, for employees to access company information.

**Portals of today.** Maintaining "lift off" as Bill Roberts put it regarding American Airlines' adoption of Jetnet; portals have evolved dramatically since early in the 21st century to become more of a mainstay for all internet users (Roberts, 2003). Though still in use by business and industry, now the average person has their own personal web portal(s) that essentially travel(s) from device to device. "One of the main goals was to get our employees to a single place where they could get all the information they needed" (Roberts, 2003, p. 96). Though the move was not easy, especially to get the many departments at American Airlines to work together, in the end it was the right thing for the company and no one department was opposed to the idea. A central group was put together at the corporate level to organize what the overall look and feel of the portal would be. This essentially made it easier for the entire enterprise to adapt.

In a similar fashion OneHealthPort also dealt with what originally was a mix of interdependent areas (Sparks, 2005). Going one step beyond JetNet though, OneHealthPort was developing a single portal that acted as a central access point for health professionals to access claims, clinical information, and prescriptions for patients from many disparate organizations. The portal brought together multiple health insurance providers that health professionals would have access to information from. The reason for such a portal was that more and more different organizations were attempting to put together a portal that allowed for better portability of information. Like American Airlines' use of a single department to oversee development of the portal, OneHealthPort created an organization, external to all commercial enterprises, to oversee the portal development (Sparks, 2005).

**Characteristics of a good portal.** Whether for work, education, or play there are some items that make some portals preferred over others by regular users. Aside from providing high quality content it is agreed a portal should provide (Roberts, 2003; Zhou, 2003; Overview of Portals, 2003): an intuitive and customizable interface, personalized content, security and allow single sign-on, and ease of use for searching, communicating, and collaboration. Content meeting these characteristics was what users enjoyed and demanded daily. Consider Yahoo's portal, "my.yahoo" which had various modules that users could add and remove as desired (Yahoo, 2013). The portal also provided interfaces that interacted with and provided auto-authorization to other external sources of information.

**Portal security.** Health Information Technology for Economic and Clinical Health currently governs the security as well as portability of health information. OneHealthPort based in Seattle Washington set out to fill the gap and securely provide access to many available sources of prescription data (Spark, 2005). With Health Information Technology for Economic and Clinical Health being intertwined with Health Information Privacy and Accountability Act, patient confidentiality ranked number one, so OneHealthPort needed to ensure proper security in the multi-organizational portal (Department of Health and Human Services, n.d.; Spark, 2005). Like many portals, the obstacle that OneHealthPort had to negotiate was to maintain a high level of security without deterring users. "An overly complicated registration and security procedure, for example, might limit participation" (Spark, 2005, p. C7). According to Merk of OneHealthPort, requiring passwords too complex in nature lead users to writing them down and posting them nearby, which, in the end only eliminated the security that such a password was attempting to provide.

## Personal Health Records (PHR)

**Requesting information.** The right to access personal medical information is given to all patients and regulated by the U. S. Department of Health and Human Services. The advent of Health Information Technology for Economic and Clinical Health has made the accessibility for patients both easier and mandatory in the electronic form. Currently, Health Information Technology for Economic and Clinical Health only mandates the bare essentials to be available electronically. At UC San Diego Health System (2013), like many health providing organizations, all a patient needs to do is to submit a request to obtain any further information. Requirements on the form are for the patient to list basic demographic information, identification numbers, type of information being requested, purpose of the request, and where the information should be sent. Department of Health and Human Services does allow health organizations to charge a fee for the distribution of this information, but it is limited to the cost of materials and labor to put the information together (Department of Health and Human Services, n.d.).

**Too much, too soon.** How medical diagnosis information is delivered can have a lasting impact on the overall satisfaction of a patient during treatment (Figg et al, 2010). Prior to the 1970's providers could and would withhold diagnosis information on the premise of what they 'don't know won't hurt them.' Bad news would be spared or spun into a less drastic prognosis in hopes of not causing depression and possibly undo harm.

Considering cancer as one of the hardest diagnosis to give and receive, numerous studies

have been performed to determine the best route to take to deliver the news (Figg et al, 2010; Thorne et al, 2010). Some of the common methods today include a single episode either in person or over the phone. For other situations the diagnosis is slowly revealed over the course of pre-scheduled consultations (Thorne et al, 2010). Occasionally the patient inadvertently finds out the prognosis through signals or attitudes of the medical support staff. Unfortunately sometimes results can be left over the phone with no one available to console the patient.
The diagnosis of cancer can be devastating; undoubtedly the results often lead to questions that the patient has (Thorne et al, 2010). Knowing how important a patient's psychological wellbeing is to optimize the outcome, providers understand that good communication of test results is imperative (Figg et al, 2010). In the Disclosing a Diagnosis of Cancer study it was found that one patient actually found out about cancer by reviewing a radiology report (Figg et al, 2010). While the study concluded that how bad news was revealed has no actual bearing on the outcome, patient satisfaction rose and the experience was optimized when a provider planned to meet with the patient in person for at least 10 minutes. The least favorable method was to utilize the telephone, especially when that meant simply leaving a message.

Throwing another form of communication in the mix, electronic media, has all but muddied the water. In Canada the question was raised regarding the inability for providers to contact their patients or vice versa via email (Fletcher & Rich, 2013). Dr. Tara Kiran responded to the inquiry and in her response she pointed out many factors that affect the usage of email (Fletcher & Rich, 2013). The most important to consider is the aspect of security and privacy. Granted that the Canadian Medical Protective Agency and Health Information Privacy and Accountability Act do not cover the topic word for word, both are on the side of the patient regarding protection of personal information. The idea that you cannot always confirm who really is on the other end of an email is a major hurdle for simply using email to allow provider/patient communication (Fletcher & Rich, 2013). The other major hurdle is the idea of a clogged inbox due to one or two needy patients.

A finding that Kiran points out is that there was still a difference between what the patient wanted to know and what a provider was prepared to provide electronically. Future rules to acquire Meaningful Use reimbursements depicted by Department of Health and Human Services eventually will require electronic communications between patients and providers. Within the guidelines of Health Information Privacy and Accountability Act law, a sort of e-communication will need to be available for the delivery of test results or for patients to inquire about health issues. So now, added to the past mix of verbal in-person or over the phone delivery of results from a healthcare provider, email or other similar types of electronic communication will soon be mainstreamed (Department of Health and Human Services, n.d.; Fletcher & Rich, 2013).

## Summary

After review of the laws that affected a patient portal as defined and enforced by the Department of Health and Human Services there was a noticeably stringent set of guidelines healthcare organizations had to follow. Initially healthcare organizations were enticed by incentives, created by Meaningful Use Stage One and Two, to establish a working portal. The tables have been forecasted to turn when the incentives for having a portal quickly disappear and fines are put forth for organizations that do not comply with the requirements.

Other items reviewed regard the method of disseminating information. Some basic guidelines of how a portal should look and feel from users' perspectives were: an intuitive and customizable interface, to allow personalized content, have security and allow single sign-on, and ease of use for searching, communicating, and collaboration. Security was the key item considered to comply with the law from the Health Information Portability and Accessibility Act that mandated how patient information can be shared and with whom.

Besides satisfying requirements of who views medical information, the medium used to deliver medical information was also established as being important. Pending the type of results it would be inappropriate to simply rely on a portal as the sole means for results to be communicated to a patient. The most serious results whether good or bad are still best delivered in person or in the most personable manner available (Figg et al, 2010). Therefore, it will be important for doctors to continue to be personable with their patients even as Meaningful Use Stage Two objectives required test and lab results to be available online within four days of the provider receiving them.

# Chapter III: Methodology

MediCorp set a goal to increase active enrollments of patients into the patient portal by 10% and reach a cumulative value of 37.5% of all patients to be actively enrolled before April 2013. To fulfill the requirement MediCorp needed to increase awareness and usage of the patient portal throughout the patient population. Previous progress was analyzed to determine possible techniques that worked versus those that had no positive effect on patient portal registration. Throughout this analysis new and improved processes were developed to enhance the enrollments in MediCorp's patient portal.

## Subject Selection and Description

MediCorp used a small local office, located in Menomonie, Wisconsin, to study current processes and pilot new techniques to increase the number of patients utilizing the patient portal. Knowledge and past experience of the employees at this location was used to develop improved processes at this location. By including the employees that needed to make use of the new processes those employees had a sense of ownership for any new developments. The sense of ownership was important to ensure each process implemented had full support of all medical personnel for complete and true analysis. Personnel involved included everyone from the appointment coordinator and receptionist to the onsite doctors. Each person in the line of care that had some type of interaction with the patient could potentially promote the patient portal.

The Menomonie location was specifically chosen for the study for a variety of reasons. Reason one was that the location was neither the worst nor the best performing location within MediCorp in terms of a cumulative percentage of enrolled patients. This fact enabled the results to be usable without making assumptions that the location was already saturated with enrolled patients or saturated with a population that was possibly resistant to registering to allow access to medical information via the internet. Another reason was the proximity to the researcher that allowed for ease of access to information and to personnel for commentary on the progress of process implementation. The final reason was that the center mimicked the setup, size, and patient population of most other rural family practice centers that MediCorp has across Northern Wisconsin.

## Instrumentation

The initial step of the process to improve active enrollments for MediCorp's patient portal was a meeting with the site manager for the Menomonie office. This meeting began with the identification of how performance of the site was measured to determine how well or if improvement was required for patient portal utilization. It was during this meeting that the decision to move forward with a combined effort to improve the current measure of actively enrolled patients occurred.

The next step in the process began with a brainstorming session with the site manager. With the site manager, the session covered the progression of introducing patients to the portal in the years prior to Meaningful Use, in the past year, and into the future. The brainstorming group also discussed what motivations there were and what the benefits would be to have patients register for and use the patient portal.

Besides a brainstorming session with the manager, the primary method used to develop new ideas was a focus group. A focus group was used at MediCorp's Menomonie office to determine possible courses of action and which direction to go. Included in the focus group were the two onsite doctors, the building manager, appointment coordinator, and the nurses' team leader. The focus group began with a short review of what the task at hand was: to increase utilization of the patient portal.

After brief introductions, the group was asked about what they thought of the current processes in place that help increase patient awareness of the patient portal. Leading up to the focus group session Medical Assistants played a leading role in identifying if a patient was already signed up for the patient portal. Then the information was passed on to the provider and, if that patient was not enrolled, the provider asked the patient about signing up to use the patient portal for online access to personal medical information. The focus group was lead into discussing the effect this process had on the length of the appointment. Finally, the topic of discussion was moved to focus on what could be improved and if there were any other ideas for increasing utilization of the patient portal.

## Data Collection Procedures

A focus group discussion was used to develop and improve processes for enhancing utilization of the patient portal. Statistic collection would be automated as every action medical staff took would be done electronically and collected by the information system in place. Actions collected would be the generation of a pin number, the registration of the patient to the portal, and the expiration of the pin number should the patient decide not to register.

A request was developed and sent to the MediCorp Health Informatics department to attain a history of the real time cumulative percentage of actively enrolled patients available to the site manager. The request included the following questions for which data was required:

(1) The number of new portal enrollments for the Menomonie Center by month back to Jan 2012

(2) The number of actively enrolled patients and patients with office visits (the numbers used to get the percentages displayed in the dashboard for the center manager, only by month and not just the current view)

(3) The number of PINs issued for patients to sign up on their own, by month

(4) The number of PINs that expired or were not used, by month

The population considered to generate the numbers was based on all patients seen within one year of the time period observed. For example to evaluate the numbers for February 2013 the report should use the number of patients with an appointment since February 2012.

**Raw data.** Overall utilization was measured by the percentage of active patients signed up for the patient portal. Basic statistical measures were calculated within Microsoft Excel. Tables were produced to clearly measure if an improvement worked. A post-implementation follow-up discussion was used to garner feedback from medical personnel regarding their thoughts of how the additional processes worked. This discussion was used to shed light on what worked and if any adjustments were needed in the future.

Tables that were created had data for the following measures: cumulative actively enrolled patients, number of new registrations, number of pins issued, and the number of pins that expired. Data for the measures will be requested from MediCorp's Health Informatics Department. Data will be stored in tables and broken down to be displayed by month for all of 2012 and through March 2013. The first data set collected was the primary measure that MediCorp used to determine the number of patients actively enrolled in the patient portal (Table 1).

Table 1

*Example - Percent of Active Enrollments*

| Year Month | Percent of Active Enrollments | Comments |
|---|---|---|
| 2012-01 | ##.#% | Pre-Meaningful Use |
| … | … | … |
| 2012-11 | ##.#% | Start of new process |
| … | … | … |
| 2013-03 | ##.#% | |

The second measure included was the enrollment change by month versus a cumulative picture of active enrollments. By tracking new enrollments by month it was easier to validate differences in results from one method to the next. Since the cumulative numbers can hide spikes or lulls data in Table 2 will show changes for each month.

Table 2

*Example - New Enrollments by Month*

| Year Month | Total New Portal Enrollments |
|---|---|
| 2012-01 | ## |
| … | … |
| 2012-11 | ## |
| … | … |
| 2013-03 | ## |

The third measure was taken to validate that for each month and for each method, a consistent amount of effort was put forth by the medical team. This measure ensured that, regardless of the number of enrollments, a sufficient number of patients were approached and issued a pin number for future registration on the portal.

Table 3

*Example: Number of Pin Numbers Issued by Month*

| Year Month | Total Pins Issued |
|---|---|
| 2012-01 | ## |
| … | … |
| 2012-11 | ## |
| … | … |
| 2013-03 | ## |

The fourth measurement was that of the number of expired pins. Expired pin number counts helped validate if a method was working, but at a delayed pace. These numbers (Table 4) allowed MediCorp to look back and consider a method used for a month with low new enrollments if patients issued pins still registered on their own in a later month.

Table 4

*Example: Number of Expired Pin Numbers by Month*

| Year Month | Total Expired Pins |
|---|---|
| 2012-01 | ## |
| … | … |
| 2012-11 | ## |
| … | … |
| 2013-03 | ## |

**Data analysis.** The t-test, correlation, and regression were all statistical methods used for deeper analysis of the raw data. Data sets for the study involved the analysis of a fifteen month period. This limited the number of results for analysis to fifteen, less than thirty. For this reason a t-test method was used to compare one time period to another for signs of improvement. The two-tailed p-value was used to determine significance of the t-test results. The two-tailed method was chosen over the one-tailed method because it was undetermined if the results were going to show an increase or decrease in new enrollments.

To determine if any tracked actions could be used as an indication of increased portal enrollments, correlation and regression tests were used. Correlation helped indicate if new enrollments could be expected to increase or decrease from one month to the next given the existence of an increase or decrease in another action. Regression tests were performed to find the p-value based on a 95% confidence interval. If the observed p-value was 0.05 or less it was determined that the observed action had a significant impact, for better or worse, on the results of new enrollments.

The tool of choice was Microsoft Excel. This platform was chosen primarily for its accessibility and portability. Microsoft Excel was available to use and worked in similar fashion regardless of the work environment: home, school, and business. This allowed for results of analysis to be shared and reviewed with ease. Overall, the platform also provided an assortment of analysis capabilities such as the ability to generate basic statistics such as average, min, and max data elements. The tool also provided regression tests for correlation and t-tests to compare how various pieces of data affected data in other categories.

The Null Hypothesis for this study was that any process would not significantly affect the number of new registrations for the patient portal. With the Alternative Hypothesis being that a significant change in the number of new registrations would be noted by implementing a new registration process. With that in mind, each piece of data was analyzed to retain or reject one of the hypotheses. First, considering the cumulative percent of patients with active enrollment and comparing each month's percentage with MediCorp's end goal of 37.5% in mind, a graph depicted climbs to or falls away from the goal. Being that the values for this measure were cumulative for a big picture view of registrations, no deductions were made from these values other than to determine if progress overall was positive toward the final measure.

The primary measure to determine success of a process change for the purpose of this study was the number of actual new enrollments each month. Based on the number of new enrollments each month, multiple comparisons were made: to pin numbers issued, expired pin numbers, and to itself to measure enrollments at different points in time. The first t-test was performed by comparing the six months leading up to the process change, with the six months from the month of change forward. The change in the average monthly enrollments for each period were compared to see if the process helped increase the count of new enrollments. Using the two-tailed p-value and a significance level of 0.05, the difference of the averages could be determined to be significant, p-value less than 0.05, or not. Without significance it is not likely that the process change had anything to do with an increase or decrease for that matter of new enrollments.

Recognizing that there may have been more to increasing enrollments than altering the registration process, the analysis went on to check to see if there was significant correlation between the number of pin numbers issued and the number of new portal enrollments. Microsoft Excel's data analysis function first calculated correlation to see if it was positive, in the same direction, or negative. Then the regression test was performed on the data set to get the p-value at a 95% confidence level. A p-value of less than .05 would indicate that any correlation found was significant; the Null Hypothesis, that the data sets were unrelated, was then rejected. A finding to the contrary would indicate the opposite and the Null Hypothesis would have been retained because no significant correlation was found between the two data sets.

In a similar fashion, as that of comparing issued pin number counts to new enrollment counts, the monthly expired pin number counts were compared to new enrollments and monthly expired pin number counts were compared to issued pin number counts for correlation. The comparisons attempted to prove the logic of A=B and B=C then A=C among the data sets. In the end, the analysis strode to demonstrate that if the number of pin numbers issued raised the likely result would be that, even though there would be more expired pins, there would also be an increase in new active portal enrollments.

In an attempt to validate that staff had a consistent pattern of pin number issuance in the fifteen month period of data, observations were broken into two distinct six month periods. Period one contained the combination of the results from the three months directly following known staff training and meetings regarding patient portal registration. The second period contained the two, three month periods following the distinct timeframes contained in period one. The premise of this check was to see how simply notifying staff of the importance of patient portal registrations to MediCorp had any effect on the number of new enrollments. Again a t-test was used to check for significance in the change of the number of new enrollments from each period. If there was consistency between the two, no significant change, then it would be possible to attribute any gains in enrollment to the establishment of a new process. Otherwise, if there was a significant difference, the difference could simply be due to the fact that the staff had motivation to help promote the patient portal increased. Therefore they may have showed more eagerness about the portal which may have led to patients wanting to register, either onsite or at home on their own.

## Limitations

Major limitations came at the point of implementation. A limitation was the ability to evaluate how well medical personnel followed through with each process improvement technique to help enhance patient portal utilization. To mitigate this and to stress the importance to all staff members, patient portal utilization numbers were shared via office communication weekly with full reports given during monthly staff meetings.

A limitation that affected the usefulness of the results was a smaller number of patients seen every day at this site. This meant that changes regardless of how noticeable for the given month over all would not have the same impact on the cumulative number of actively enrolled patients. The study also only concentrated on overall registrations. The study did not distinguish between onsite or at home registration.

Limitations that factor into the restricted use of the study’s results involve the software and hardware of the study. The portal as it was for the study would be the only way to attempt to replicate this exact study. The staff and patient population and demographic makeup limit the use of this study. Demographics were not analyzed to determine if one patient would be more likely to register over the next. The same concept was true for the medical staff as the study did not validate that an appointment coordinator would be any more likely to issue a pin number to a patient that would register for that portal than a doctor or medical assistant.

## Summary

Overall the methodology of the study was a four step circular process. Step one was to review the current state of progress. A focus group met to discuss the current status and actions that got MediCorp to the level of active enrollments achieved currently. Step two included evaluation of new course of action for improvement. As part of the focus group, new techniques were identified. Each technique was evaluated against levels of improvement considering the amount of extra time a patient visit required to implement the new process. Third was to implement and pilot possible improvements. An impediment discussed in the focus group, was whether or not the new process got in the way of the visit or the next patient waiting to start their visit. Beyond that the numbers based on improvement or lack of improvement will help identify which implementations worked and which ones did not. The fourth step was to collect feedback on how the new process implementations worked. The measures for improvement will be evaluated first. Before any process gains final approval it must have cleared the hurdle of not impeding upon patient care and office time management.

# Chapter IV: Results

MediCorp as a whole was split up into smaller entities; clinics and centers, which serve various regions of Northern Wisconsin and parts of the Upper Peninsula, Michigan. MediCorp has a strategic goal to have 50% of all patients in their care to be actively registered for MediCorp's Patient Portal. As part of the tactical steps to attain this corporation wide goal, a goal of 35% was given to each individual center.

When MediCorp of Menomonie received the new goal, in September 2012, its current percentage of patients with active portal enrollment was at 28.8%. The number was not far from the interim goal, but the site had been stagnant at 28.8% for the past couple of months. Having seen only slight increases of tenths of a percent, something had to change.

A focus group was put together to combat this issue with the overall goal to increase active registration by 10% by July 2013 and exceed the system wide goal set. The group was well aware that a process would have to be developed to increase patients' awareness that the portal existed and provide enough reason for the patient to take the time to register. An underlying issue was that this process, whatever it may be, would have to increase portal registrations without actually increasing the time of a patient’s office visit.

## Brainstorming

When meeting with the Menomonie office site manager, many discoveries were made regarding the history of the promotion of MediCorp’s patient portal. It was a discovered that up until the calendar year 2012, the portal had never been promoted to patients as a primary source of medical and billing information. Only if a patient inquired about the portal, after receiving a bill that mentioned the ability to pay on-line, would someone from the medical staff answer questions and/or suggest the ability for the patient to log-in to MediCorp’s patient portal to view and remit payment. At this time staff would also mention that the portal offered the ability to view the latest test results and request additional appointments.

## Focus Group Meeting 1

The first meeting for the focus group was scheduled in November 2012, shortly after MediCorp of Menomonie's receipt of the system wide portal goal. At this point MediCorp of Menomonie had been simply following the basic guidelines given by MediCorp leadership. In general with these guidelines there were three points during any given visit to inquire to the patient about the status of being actively enrolled in the portal or not. The group discussed the current process which included checks with the patient by the entire care team starting with the receptionist at check-in, the nurse or medical assistant that roomed the patient, and finally the doctor that examined the patient.

It was expected that at each step of the visit, the care team should check the patient's portal enrollment status. If the patient was not actively enrolled, then the team member was to inquire if the patient would like to enroll. At that time a temporary pin number would be generated by the system and given to the patient. The patient would then take this number home, to work, or anywhere else with an internet connection with directions on how to create an online account and enroll into MediCorp’s Patient Portal.

Upon analysis of the current process of measurement flaws were pointed out. The first of these flaws was that questions were left unanswered related to how many times a patient would agree to accept a PIN number, but would not use the number to register after leaving the visit. Another related comment was that a process should be put in place that could allow on-site registration.

The focus group settled on trying to make the on-site registration work. To attempt to make this work without affecting both the normal flow of an appointment or drastically increase the length of an appointment for a patient was not an easy undertaking. Step one in the process was to get the proper equipment. Hardware and software were ordered to get a laptop station setup that could access the internet without enabling access to internal applications and data. Secondly, a space to house this workstation would need to be setup without impeding day-to-day activities of the staff. The last part of the process was that a staff member at some point during an appointment would need to be able to assist the patient in registering for MediCorp's Patient Portal. This last step needed to happen without affecting the overall length of a patient visit.

The decision made by the original focus group was that for a few days a week the manager's administrative assistant, when on site, would be the primary person to work with patients that began new portal registrations. Having access to this additional staff member, left the medical staff available to continue with the next patient or with the clean-up process to prepare the room for the next appointment. On other days, the lab technician and appointment coordinator swapped back and forth to assist whenever needed to register patients, so long as they were not already assisting another patient first. Overall, this also allowed for the medical staff to continue on with the next appointment or tasks in preparation for the next appointment.

## Measures

The Alternative Hypothesis for this study was that, by implementing an onsite enrollment station, the number of portal registrations would increase. By satisfying the Alternative Hypothesis MediCorp of Menomonie would be able to increase the percentage of patients with active portal enrollments. Listed in the next few sub-sections are the raw data elements used for analysis to determine if the Alternative Hypothesis would be accepted or if the Null Hypothesis would have to be accepted; that there was no significant difference in portal registrations with an onsite enrollment station.

**Cumulative active accounts.** The observed measure system wide was related to the measure of active enrollments based the percentage of patients with active enrollments of all patients seen at the center that have declared a provider at that center as their primary care physician. All though patients can obtain enrollment into the Patient Portal regardless of how many visits they have or which center they decide to visit, to be considered in the calculation the patient must consider the provider at MediCorp as their primary. Based on end-of-month percentages here is how the year played out:

Table 5

*Percent of Active Enrollments*

| Year Month | Percent of Active Enrollments | Comments |
|---|---|---|
| 2012-01 | 16.8% | Pre-Meaningful Use |
| 2012-02 | 21.1% | Start of initial efforts |
| 2012-03 | 23.4% | |
| 2012-04 | 25.2% | |
| 2012-05 | 26.3% | |
| 2012-06 | 27.1% | |
| 2012-07 | 27.7% | |
| 2012-08 | 28.3% | |
| 2012-09 | 29.3% | |
| 2012-10 | 30.3% | Start of new process |
| 2012-11 | 31.7% | |
| 2012-12 | 32.4% | |
| 2013-01 | 33.8% | |
| 2013-02 | 33.9% | |
| 2013-03 | 34.3% | |

Summarizing the data at a glance, the cumulative percentage indicated that each month, progress was made toward the overarching goal to have 35% of all active patients actively enrolled with the patient portal. Comparing the month of January across years, the cumulative percentage climbed over 100%, rising from about 17% to nearly 34%. Over the course of time there were a both plateaus and periods of steady climb as observed in Figure 2.

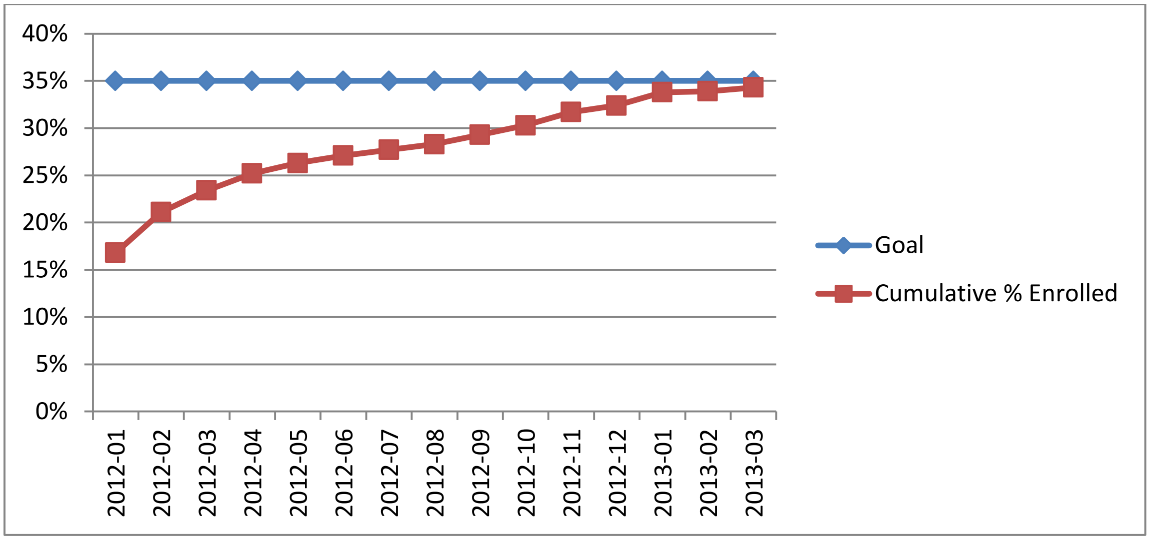

*Figure 2:* Cumulative percent of actively enrolled patients compared to the goal.

**New portal enrollments.** Throughout the year the number of new enrollments has fluctuated. There was a definite increase in the percentage of active portal enrollments early in the 2012 calendar year. However the percentages hit a ceiling and came to a crawl. In Table 6, organized by month throughout the year, the numbers are related to new enrollments.

Table 6

*New Enrollments by Month*

| Year Month | Total New Portal Enrollments |
|---|---|
| 2012-01 | 15 |
| 2012-02 | 31 |
| 2012-03 | 21 |
| 2012-04 | 15 |
| 2012-05 | 6 |
| 2012-06 | 10 |
| 2012-07 | 8 |
| 2012-08 | 5 |
| 2012-09 | 3 |
| 2012-10 | 12 |
| 2012-11 | 9 |

| Year Month | Total New Portal Enrollments |
|---|---|
| 2012-12 | 10 |
| 2013-01 | 17 |
| 2013-02 | 1 |
| 2013-03 | 5 |

February 2012 was the first month for MediCorp to begin pushing for patient portal enrollments; the data showed that there had been a drastic increase in the volume of new enrollments. As time progressed and staff momentum decreased, progress of the initial stand to try and get all patients enrolled began to taper off. In the last quarter of 2012, when the new process for on-site enrollments began, it was notable that another jump in new monthly enrollments occurred.

The first comparison was to identify if having the onsite registration met the Alternative Hypothesis compared to the status-quo; the six months leading up to implementation and the six months after implementation were shown in Table 7.

Table 7

*Summarized Statistics and t-test Comparison of New Enrollment Numbers for Pre and Post Implementation Periods*

| Pre-Month | Pre-Implementation Enrollments | Post-Month | Post Implementation Enrollments |
|---|---|---|---|
| 2012-04 | 15 | 2012-10 | 12 |
| 2012-05 | 6 | 2012-11 | 9 |
| 2012-06 | 10 | 2012-12 | 10 |
| 2012-07 | 8 | 2013-01 | 17 |
| 2012-08 | 5 | 2013-02 | 1 |
| 2012-09 | 3 | 2013-03 | 5 |
| Mean | 7.833 | | 9 |
| P(T<=t) two-tail | 0.692 | | |

Summarized statistics for the data set yielded an average of 7.8 registrations per month prior to the study. After the study began that average raised to 9 registrations per month. At a significance level of 0.05 and p-value, using a two-tailed test, of 0.692, the statistics indicates there was no significant increase in portal registrations after implementing the onsite registration process. The original Null Hypothesis was retained based on this test because there is not overwhelming evidence that the onsite registration process enhanced the number of new enrollments.

**Portal registration attempts.** One part of the enrollment process, which is the first step on the way to a successful patient portal enrollment, pertains to the issuing of a pin number. This typically happens after medical staff identifies that a patient does not have an active portal enrollment and then proceeds to inquire whether the patient would like to register. Though issuing a pin does not imply that a patient will be registered, having the volume of pins issued, measures the success medical staff have with the initial sale of the patient portal. As the data in the following table was considered, the average number of patients seen per month is 573 patients. Under consideration was the fact that the number of patients that were already enrolled averaged 244 patients per month. Overall, upon review nearly all patients that were not actively enrolled accepted a pin number for registering.

Table 8

*Number of Pin Numbers Issued by Month*

| Year Month | Total Pins Issued | Total New Portal Enrollments |
|---|---|---|
| 2012-01 | 120 | 15 |
| 2012-02 | 250 | 31 |
| 2012-03 | 433 | 21 |
| 2012-04 | 285 | 15 |
| 2012-05 | 202 | 6 |
| 2012-06 | 161 | 10 |
| 2012-07 | 156 | 8 |
| 2012-08 | 155 | 5 |
| 2012-09 | 147 | 3 |
| 2012-10 | 271 | 12 |
| 2012-11 | 231 | 9 |
| 2012-12 | 205 | 10 |

| Year Month | Total Pins Issued | Total New Portal Enrollments |
|---|---|---|
| 2013-01 | 218 | 17 |
| 2013-02 | 94 | 1 |
| 2013-03 | 115 | 5 |

Though not directly related to identifying if the onsite registration process would increase enrollments, looking for a correlation between issuing pin numbers and the number of enrollments was something to consider. Comparing issued pin numbers to portal enrollments a correlation of 0.629 was observed which indicates there was correlation. After regression analysis at a 95% confidence interval a p-value of 0.012 was yielded. The results indicated a strong correlation between the number of issued pin numbers and the number of new enrollments in a month. For this sub-test the Alternative Hypothesis was retained if the number of issued pin numbers rises or falls so shall the number of new enrollments rise or fall.

Another interesting piece of information retrieved from the number of issued pin numbers is related to medical staff involvement; given staff training or shedding light upon the importance for portal registrations based on new laws, how willing was the staff to promote the patient portal? Under the Null Hypothesis, training had no effect on the issuance of pin numbers. The month of training and two months following training were compared to the all other months considered in the study. The two training periods again were defined as February 2012 – April 2012, when Meaningful Use training was first given to medical staff, and October 2012 – December 2012, when the new registration process was introduced. The average number of pin numbers issued with concurrent training was 279 with 158 being the average number of the three month periods following the train. The two-tailed t-test resulted in a p-value of 0.010 at the 0.05 significance level. The p-value indicates that the difference in the averages between the two periods is significant and that it is highly likely that when the staff was more aware of the importance of portal registrations the number of issued pin numbers increased.

**A lasting impression.** The final measure observed is related to the number of pin numbers accepted by patients that were allowed to expire. For patient security, in case a pin number is dropped, misplaced, or otherwise left unused that pin will expire after only a few weeks. Previously, the measure of the number of pins issued was used to verify that the medical staff were inquiring about a patient's desire to enroll. By looking at the number of expired pin numbers, the motivation that a patient is left with to actually take that pin home and register can be evaluated. Sometimes, just to appease the medical staff, it is possible that a patient would simply accept the pin and then forget about it as soon as they left the clinic. These numbers were important as they may indicate where the level of advertisement is failing or may dictate needed changes in scripts prepared for medical staff to utilize as they inquire about a patient's desire to enroll.

Table 9

*Number of Expired Pin Numbers*

| Month | Total Expired Pins | Total New Portal Enrollments |
|---|---|---|
| 2012-01 | 79 | 15 |
| 2012-02 | 146 | 31 |
| 2012-03 | 137 | 21 |
| 2012-04 | 98 | 15 |
| 2012-05 | 71 | 6 |
| 2012-06 | 62 | 10 |
| 2012-07 | 66 | 8 |
| 2012-08 | 55 | 5 |
| 2012-09 | 47 | 3 |
| 2012-10 | 86 | 12 |
| 2012-11 | 78 | 9 |
| 2012-12 | 73 | 10 |
| 2013-01 | 73 | 17 |
| 2013-02 | 29 | 1 |
| 2013-03 | 29 | 5 |

The Null Hypothesis regarding expired pin numbers is that there is not a significant correlation between the number of expired pins and new portal enrollments. However, upon further analysis a positive correlation of 0.915 is present, meaning values in both areas tend to climb and fall together. Not only is correlation present, with a p-value of nearly zero on a 95% confidence interval, the correlation is quite significant. Deduced from these findings is that generally to get many failures or expired pin numbers there must be many pin numbers issued. This was confirmed by the correlation of the number of issued pin numbers to the number of new enrollments.

To deduce the correlation with certainty, the correlation between the counts of pin numbers issued and the counts of expired pin numbers was also required. At a glance the Alternative Hypothesis that the two numbers do hold significant correlation appeared true. When put to the test a positive correlation was noted at 0.819. The significance was also confirmed with a p-value of 0.000, again on a 95% confidence interval.

## Summary

Overall the results did not indicate evidence that adding the new onsite registration process impacted the number of new enrollments by month. When compared to the results achieved after the initial process that entailed the display of information that advertised the benefits of utilizing the portal, there was little difference in the effects as to which was more effective. For the staff, both processes required action on their part to engage with the patient about the portal. Measurements were taken and analyzed to validate whether the mere practice of establishing a process had any effect on the rise or fall of monthly portal registrations. There was a significant correlation between periods with established programs and processes the staff were trained on and an increased number of monthly enrollments. Periods that immediately followed the kickoff off of each process showed increased monthly enrollment versus later periods, as staff lessened their dedication to gaining portal registrations.

Results showed that MediCorp should continue to hold regular training for staff regarding the patient portal and the relation it holds to Meaningful Use requirements. The training was able to familiarize staff with the portal and registration process which in turn led to better informed patients and higher registration rates. The results did not indicate that the new onsite registration process helped to increase the cumulative percentage of active patients register for the portal

# Chapter V: Discussion

Statutes under the Meaningful Use Final Ruling have required better utilization of Electronic Health Records in the health industry. As such, Meaningful Use generated requirements that medical institutions shall provide unlimited access to medical records for patients. Soon, under these statutes, it will be required for electronic communication to be available and used as test results or questions pass between provider and patient. Early on in the development of the requirements MediCorp had been working hard to meet all stages of Meaningful Use. Currently, the bonus for meeting the standards is that MediCorp qualifies for special incentives from Medicare programs for services. With a strong history of utilizing technology, MediCorp attempts to make strides to stay ahead of the industry curve whenever possible. For this reason MediCorp operations, IT, and medical staff have come together with one strategic goal to have over half of the patients actively enrolled in the online patient portal. An objective on the path to reach that goal is for each individual location to achieve a cumulative percentage of 35% of patients actively enrolled.

Even though the initial requirement for MediCorp is to prove to Centers for Medicare and Medicaid Services the ability to have an online portal capable of providing basic medical information to a patient based on the patient's Electronic Health Record within the guidelines of Meaningful Use, the bar was set to go above and beyond the baseline requirement. MediCorp wanted nothing less than to get all patients to actively use the portal. As part of the strategic planning process, smaller steps were taken to meet short and long term goals. On the path to 100% a mid- to long-term goal of 50% was set to be attained system wide in the next three years with a shorter-termed goal of 35% to be met by spring 2012.

Throughout the study, the Meaningful Use guidelines have been summarized to clearly indicate MediCorp's motivations for providing patients with a usable patient portal. First and foremost MediCorp has a commitment to providing high quality health care. By providing personal access to medical information patients are better able to track their health. The secondary motivation is protecting the bottom line. Incentive dollars were important to funding research and development of techniques to provide better and higher quality care which was important to MediCorp. Eventually when these incentives go away, the possible fines or discounted reimbursements could be detrimental to MediCorp's ability to provide proper care for patients.

Though only a single process improvement technique, to implement onsite portal registration, was the basis of this study, measurements have been established to provide future analysis and MediCorp strives toward continuous improvement. Reports for raw data collection have been established and can be requested at any time for any range of dates. Usage of specific statistical analysis techniques have been established for the raw data to provide insight into possible reasons for success or failure of any new process.

## Limitations

The study, of the process to determine how best to promote MediCorp's Patient Portal at the Menomonie location, had limitations. Development of the process did not directly pertain to the care of patients and due to the Health Information Portability and Accessibility Act, direct observation by the reviewer on how medical personnel applied the techniques discussed was not possible. Reliance on and trust in their professionalism to follow through was key to the success of the study. The focus group meeting and follow-up experiences with the medical staff were the primary sources of information on how any process changes affected their ability to care for patients. The final limitation to recall was the number of patients seen by the practice. The unique patient count was relatively low which can lead to skewed results for better or worse. If every month the same set of patients are seen repeatedly and that set happens to be the few already enrolled in the Portal, then the monthly percentage of Portal enrolled patients seen that month would be considered high or there would likely be very few new enrollments. The opposite would be true if un-enrolled patients were the type of patients seen by the practice with repeat monthly appointments throughout the study. Though this situation would then present itself with a greater amount of opportunity to enroll more patients.

Along with the fact that patient numbers were a limiting factor, so was that of the demographic makeup of the current patient population. Statistics of the population make up were not collected; nor was that of the type of people that make up the population already registered for the portal. This study was not created to generate the profile of a person most likely to register for the portal as a means of classifying patients.

Likewise, the staff was also not singled out in terms of who issued more pin numbers and of those pin numbers issued which ones would have been most likely to register. Instead the results of the staff's labors were tallied as cumulative results. Regardless of the pin number being issued by the appointment coordinator, the medical assistant, or the doctor the study counted that as a pin number issued by the staff.

This study was limited to observing process changes only. The software and hardware that make up the patient portal could not be considered and as such results of this study were limited to application for the portal as it existed at the time of the study. Changes to software and hardware that could make the portal more appealing were not studied as a means of improving overall utilization of the patient portal.

## Conclusions

**Mid-study feedback.** The end goal of this study was to find a process that would help the MediCorp's center in Menomonie, Wisconsin attain the short-termed goal of having 35% of all patients seen at the center actively enrolled in MediCorp's patient portal. The key measure for this was defined by MediCorp as the Cumulative Count of Active Accounts. The value is broken down by location and available to all site managers via a dashboard used for displaying financials and other pertinent information of value. During the second focus group meeting the results of the first couple of months had been shared; only the results of this measure were made available.

The initial results with a slight increase in the metric of the cumulative percentage of patients registered for the portal were first revealed to the group. At the time as the new year and quarter were beginning, the measure raised about 3%. The meeting initially began as staff recalled occasions when it seemed like almost everyone that came in for an appointment on a given day was registering with the onsite registration now available. Staff wondered why the increase was so slight. The team was reassured that with the number of patients considered in the cumulative value, the addition of one month's worth of patients did not allow the percentage to change drastically. This was especially made true when it was discovered that many of the patients registering recently were in fact new patients. Simple math using 400 divided by 600 and then 415 divided by 615 revealed that though many new registrations for new patients increased the metric, the overall result using only the cumulative percentage was less appealing given how little the larger number of new registrations for the month increased the cumulative percentage.

Final feedback received from medical staff members was that the number of people that actually utilize the onsite registration has dwindled. Though it has not negatively affected patient satisfaction regarding slightly lengthened visits, the process to register a patient onsite has interrupted the rooming process. At this point the interruption was only for the current workflow and overall did not impact the care provided for the patient or the care that could be provided for another patient.

**Measuring for success.** Given the explanation, the new process was allowed to continue. New measures to support tracking the immediate progress of the process were developed. Final review of monthly statistics showed that, as expected in the second focus group meeting, the number of portal registrations was indeed on the rise. Throughout all of the third quarter the revived motivation and the new registration process have gotten the center moving forward toward MediCorp's system wide goal.

With the new measurements a by month overview could easily be achieved. Early in the year there was much success, which was attributed to the initial training on the Meaningful Use requirements. During this period, system wide, centers were given training on the future importance of patients utilizing the patient portal that had actually been in existence for eight years, since February 2004, at the time early in 2012. Having seen how meeting this goal can have direct effects on the bottom line, everyone adopted the change. In the summer, there was a lull in the number of successful registrations. During this period the number of pin numbers issued remained at a consistent percentage of patients not already signed up. This indicated the attitude portrayed at the onset of this study by the medical staff.

Proceeding with the initial focus group meeting, medical staff once again dedicated their efforts. Providers were able to confer with support staff and give testimony about how helpful some of the features such as provider/patient electronic messaging had been for providing high quality health care. This first-person experience, along with the reminder of how meeting the Meaningful Use requirements affect the bottom line, led to staff compliance. The staff meeting provided training and established a new process for everyone to rebuild staff dedication to increase portal registrations. Evidence of this was shown with monthly registration numbers that increased in October 2012 and carried through to January 2013.

**Turnover and the downward spiral.** During February 2013, the middle of the first quarter 2013, the number of monthly registrations plummeted. Possibly attributed to it being a few months since refocusing staff on the portal registration process, staff may have been getting back into the rut that allowed the registrations numbers to drop previously in 2012. At the start of February 2013 the site manager's administrative assistant resigned to take on a new opportunity which could also be attributed to the downward trend of new enrollments. The administrative assistant originally played a pivotal part in the onsite registration process as she was able to assist with registration as needed without any impact on patient care. At the beginning of April 2013, the cumulative percentage was at 34.3%. This did not meet the system goal or the goal of a 10% increase set at the onset of this study. However, progress throughout the study has always been in the forward direction.

## Recommendations

The onsite registration did not lead to increased numbers of patients actively enrolled with the portal. An indication for this was that the four best months during this study did not overcome the success of the first four months of 2012. Also the improvements after implementation compared to the previous six months did not indicate a significant change. On the other hand, the onsite registration process did not have a negative impact on the overall monthly enrollments.

One conclusive item consistent with the vast number of registrations early in 2012 and those at the close of 2012 was that prior to both periods there was a meeting that focused on the aspects of meeting Meaningful Use requirements. Discussion in part of those meetings was on how important things like portal registrations were to meeting Meaningful Use requirements. At both points in the year, the highest numbers came after one of these sessions. Analysis of the time periods immediately following training with the time periods after training was allowed to fade clearly showed a strong correlation that the training had on patient enrollments. The correlation showed the effectiveness that discussing patient portal registrations had on the medical staff's ability to promote and in the end convince patients of the benefits of enrolling.

**Final remarks.** At the conclusion of the study the office must make the portal a regular priority at staff meetings. To keep staff engaged with portal enrollments, change up the preferred methods of introducing the portal to patients among staff. This should keep the staff engaged and interested in the success of increasing the percentage of actively enrolled patients, which has been shown to be most effective.

The onsite registration process should continue to be available. To keep the onsite registration effective, staff will have to continue to learn about the features of the patient portal so that they have material to use when telling patients about the benefits of registering. Further improvements will need to be made to enhance the onsite enrollment process. The first suggestion is to consider waiting until the end of a patient's office visit to register them on the portal. By doing this it will be less likely to interrupt the workflow as patients check-in, get roomed, and complete their exam. This will allow the staff providing care to continue on without interruption while the support staff can take over outside the regular window of care. Another solution, that will likely take more time to implement, is to make progress toward setting up a portal registration station in the waiting room that patients can utilize either before or after a visit.  Possibly, one day, the handwritten check-in slips typically used and filled out on a clip board will eventually be replaced with a tablet that would allow a patient to both check-in for the appointment and register for the online portal at the same time.

Overall, the study did not prove that onsite registration was the definitive method of choice, but it did show that staff training helped drive portal registrations.  The results showed that increased rates of issuing pin numbers were increased by periodic focused training or staff meetings.  By increasing the number of pin numbers issued the study also showed that the number of monthly enrollments was likely to rise as well.

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## Appendix A: Meaningful Use Stages

# Stage 1 Requirements

### Core Objectives

(1) Computerized provider order entry
(2) E-Prescribing (eRx)
(3) Report ambulatory clinical quality measures to Centers for Medicare and Medicaid Services/States
(4) Implement one clinical decision support rule
(5) Provide patients with an electronic copy of their health information, upon request
(6) Provide clinical summaries for patients for each office visit
(7) Drug-drug and drug-allergy interaction checks
(8) Record demographics
(9) Maintain an up-to-date problem list of current and active diagnoses
(10) Maintain active medication list
(11) Maintain active medication allergy list
(12) Record and chart changes in vital signs
(13) Record smoking status for patients 13 years or older
(14) Capability to exchange key clinical information among providers of care and patient-authorized entities electronically
(15) Protect electronic health information

### Menu Objectives

(1) Computerized provider order entry
(2) Drug-drug and drug-allergy interaction checks
(3) Record demographics
(4) Implement one clinical decision support rule
(5) Maintain up-to-date problem list of current and active diagnoses
(6) Maintain active medication list
(7) Maintain active medication allergy list
(8) Record and chart changes in vital signs
(9) Record smoking status for patients 13 years or older
(10) Report hospital clinical quality measures to Centers for Medicare and Medicaid Services or States
(11) Provide patients with an electronic copy of their health information, upon request
(12) Provide patients with an electronic copy of their discharge instructions at time of discharge, upon request
(13) Capability to exchange key clinical information among providers of care and patient-authorized entities electronically
(14) Protect electronic health information

# Stage 2 Requirements

**Core Objectives**

(1) Use computerized provider order entry for medication, laboratory and radiology orders directly entered by any licensed healthcare professional who can enter orders into the medical record per state, local and professional guidelines.
(2) Generate and transmit permissible prescriptions electronically (eRx).
(3) Record the following demographics: preferred language, sex, race, ethnicity, date of birth.
(4) Record and chart changes in the following vital signs: height/length and weight (no age limit); blood pressure (ages 3 and over); calculate and display body mass index (BMI); and plot and display growth charts for patients 0-20 years, including BMI.
(5) Record smoking status for patients 13 years old or older.
(6) Use clinical decision support to improve performance on high-priority health conditions.
(7) Provide patients the ability to view online, download and transmit their health information within four business days of the information being available to the EP.
(8) Provide clinical summaries for patients for each office visit.
(9) Protect electronic health information created or maintained by the Certified Electronic Health Record Technology through the implementation of appropriate technical capabilities.
(10) Incorporate clinical lab-test results into Certified Electronic Health Record Technology as structured data.
(11) Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research, or outreach.
(12) Use clinically relevant information to identify patients who should receive reminders for preventive/follow-up care and send these patients the reminders, per patient preference.
(13) Use clinically relevant information from Certified Electronic Health Record Technology to identify patient-specific education resources and provide those resources to the patient.
(14) The EP who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform medication reconciliation.
(15) The EP who transitions their patient to another setting of care or provider of care or refers their patient to another provider of care should provide a summary care record for each transition of care or referral.
(16) Capability to submit electronic data to immunization registries or immunization information systems except where prohibited, and in accordance with applicable law and practice.
(17) Use secure electronic messaging to communicate with patients on relevant health information.

**Menu Objectives**

(1) Capability to submit electronic syndromic surveillance data to public health agencies except where prohibited, and in accordance with applicable law and practice.
(2) Record electronic notes in patient records.
(3) Imaging results consisting of the image itself and any explanation or other accompanying information are accessible through Certified Electronic Health Record Technology.
(4) Record patient family health history as structured data.

(5) Capability to identify and report cancer cases to a public health central cancer registry, except where prohibited, and in accordance with applicable law and practice.
(6) Capability to identify and report specific cases to a specialized registry (other than a cancer registry), except where prohibited, and in accordance with applicable law and practice.