Evaluation of the Patient Portal Program in UFHealth at Neuromedicine.

INTRODUCTION

Patient-centered care, in which the patient is an active participant in managing his or her health, improves patient and health care team satisfaction and health outcomes\(^1\). Improvements in the healthcare system will require greater engagement of patients and their caregivers with the system. Shared decision-making involves participation by both patients and physicians to share treatment preferences, to set goals, and to make joint determination of the treatment plan. One of the engagement modalities is the patient portal\(^2\).

Portals are intended to support engagement by providing patients and families access to their health care information and facilitating communication with the health care team. Portal use has also been suggested as a mechanism for patients and/or families to identify medical errors, thus having the potential to improve the safety and quality of care. Specifically, portals allow patients to review their prescribed medication list and identify and report discrepancies to their health care team, and thus potentially prevent adverse drug events\(^2\).

The US government defines a patient portal as “a secure online website that gives patients convenient 24-hour access to personal health information from anywhere with an Internet connection” \(^3\). The data are managed by the health care organization, and even the most rudimentary portals enable patients to access information like recent doctor visits, discharge summaries, medications, immunizations, allergies, and lab results. More advanced portals enable patients to request prescription refills, schedule non-urgent appointments, and exchange secure messaging (SM) with their provider\(^3\).

To better understand what electronic health portals are about, it is pertinent to have a clear understanding of the various technologies that support them. Firstly are the **patient portals**, which are health care-related online applications that allow patients to interact and communicate with their health care providers\(^4\). The second is the electronic health records (EHR), which is a repository of patient data in digital form, stored and exchanged securely\(^4\). EHR systems are the software platforms that physician offices and hospitals use to create, store, update, and maintain EHRs for patients\(^4\). **By definition, an EHR portal is a Web-based application that combines an EHR system and a patient portal, not only for patients to interact with their health care providers, but also to access their own medical records and medical exam results**\(^4\).

Patient portals were introduced and adopted by a few large health care organizations in the late 1990s\(^5\). However, patient portals did not gain widespread acceptance and use in the healthcare industry until 2006 when several initiatives coincided, including the launch of electronic personal health records (ePHRs) by Microsoft and Google, the awarding of Centers
for Medicare and Medicaid Services (CMS) contracts to private firms to conduct feasibility studies of ePHRs using existing claims data from Medicare programs, and Blue Cross and Blue Shield Association and America’s Health Insurance Plans’ announcement to develop data-sharing programs that would ultimately support ePHR development⁵. These initiatives also coincided with the broad social movement towards adoption and daily use of information and communication sharing tools such as smartphones and social media, illustrating the readiness of the general population to embrace technology in a new socially interactive way⁵.

**Development** of the patient portal has been driven in part by the belief that systems will enhance patient satisfaction, improve care, and make care more efficient⁶. Cross-sectional Studies have demonstrated that people pay more attention and become more engaged in their health and medical care when they have easy access to their health information online and become participating members of the healthcare team rather than passive recipients of care⁶.

Patient Portals can offer important benefits to patients, providers, and healthcare organizations. These technologies, particularly when integrated with an electronic health record (EHR), have the potential to improve both quality outcomes by enabling patients to: communicate electronically and securely with their provider; access their medical records; schedule appointments; pay bills; and refill prescriptions⁷.

**Access** to outpatient patient portals has increased dramatically, driven in large part by meaningful use (MU) requirements from the Centers for Medicare and Medicaid Services EHR incentives program³. Features mandated by MU that directly relate to patient portal functionality include providing (1) a clinical summary to the patient after each visit, (2) secure messaging (SM) between patient and provider, (3) ability to view, download, and transmit personal health record data, (4) patient specific education, (5) patient reminders for preventative services, and (6) medication reconciliation⁵.

By providing these tools, as well as easy access to online resources, patient portals can benefit providers and improve patient outcomes by improving: readmission rates, care efficiency management of chronic illness, and engagement among patients and families in care⁷.

The evidence of the impact of these portals on promoting patient-centered care and improved outcomes in adult patients is growing, but before a patient portal can serve as a tool for individuals to become more engaged and involved in their own care, patients must first adopt it⁵.

**BACKGROUND OF THE PROBLEM**

UFHealth adopted its own patient portal called *MyUFHealth* on October 20, 2010, and despite the potential advantages to patients, enrollment into *MyUFHealth* has been slow to permeate all service-line areas including Neuromedicine, specifically Neurology and Neurosurgery. As at
December 2016, enrollment into MyUFHealth was reported to be 32% in Neurosurgery, and 46% in Neurology.

Institutionally, the median utilization rates hover around 70%. Research has shown that increased enrollment in patient portals has the potential for better clinical outcomes and patient satisfaction. In a comprehensive study conducted by Kaiser, the investigators determined that the use of secured patient-physician email was significantly associated with improved performance for all HEDIS measures. The proportion of patients whose measures improved ranged from 4 percent to about 11 percent.

In view of this, the Neuromedicine Interdisciplinary Clinical and Academic Program (NICAP) leadership created an initiative to increase patient enrollment in MyUFHealth. This initiative consists of several layers, which includes trained undergraduates actively promoting the benefits of the portal to eligible patients, encouraging and offering enrollment assistance, educational and promotional materials, as well as push email notifications upon checkout. This particular intervention was implemented because studies have shown that most patients are uninterested in enrolling for the portal due to a lack of information and motivation. Using trained interns as an information resource and agents for providing physical and emotional motivation will allow for onsite enrollment and increased knowledge of the portal and its functionalities.

**OBJECTIVE**

The goal of this pilot project was to increase the MyUFHealth activation rate by 5%, in neuromedicine patient population at UFHealth, within 1 quarter.

**METHODOLOGY**

**Program Overview**

This quality improvement (QI) project was piloted on a small-scale using process improvement techniques adapted from industry such as the continuous QI model by Deming, Lean, and Six Sigma and Plan Do Study Act (PDSA). For this project, these techniques were based on incremental, cyclically implemented changes using a structured approach to select, implement, test, and refine interventions.

The program focused on a well-defined problem, with built-in feedback on immediate outcomes to allow for the adjustment of interventions.
Setting

This evaluation study was conducted at UFHealth, department of Neuromedicine, a healthcare facility, which uses a commercial electronic patient portal called MyUFHealth. MyUFHealth allows a patient to log on to a secure portal to access personalized health information, including laboratory results and medication list. Patients can also send secure electronic messages to their physicians. Upon their visits, activation codes are provided at checkout for patients to go online and set up their online access. This number is specific to that particular patient and the account can only be accessed with the information that patient enters for their specific chart.

Prior to the implementation of the NICAP initiative, portal availability was advertised with pamphlets at each clinic and with electronic information on the clinic’s Web site. With the NICAP implemented program, trained NICAP interns stationed at specific locations in Neuromedicine offer access to the portal to patients. Interns typically discuss MyUFHealth with patients and assist them in installing and signing up for the portal upon receipt of an activation code.

The hypothesis is that if interns are actively assisting patients in signing up for MyUFHealth, there should be a corresponding increase in patient enrollment into the electronic portal, after the intervention.

Study Design

Due to the pilot nature of this project, an uncontrolled before and after evaluation study design was chosen for this project. This involved the measurement of the target of the QI intervention, in this case, the rate of MyUFHealth activation before and after the intervention, in same study sites within a cross-sectional patient population.

Sample

All patients with an established care with an attending physician in Neurosurgery and neurology clinic was included in our sample. An established care was defined as at least one visit between January 9th, 2017 and March 31st, 2017.

Outcomes

For process evaluation, the proportion of eligible patients who successfully signed up for MyUFHealth after an encounter with the NICAP interns was reported. Number of successful sign-ups (defined as registering for the account and activating the account on-line), was the process measure, and this was collected and analyzed between January 9th to March 30th, 2017.
For impact evaluation, we selected the overall patient portal activation rate as of March 31st, 2017, as the primary outcome variable.

Data Analysis

Qualitative methods were adopted in this study, for the collection, organization and analysis of textual information to emphasize the understanding of meanings and experiences useful for quality assessment. This also formed the theoretical basis for why the intervention lead to an improvement; as well detect obstacles to changing performance.

For process evaluation, data were analyzed using descriptive statistics. The two primary categorical variables were successful sign-ups and failed sign-ups. Within these categories, we had sub-categories to delineate reasons for successful and failed sign-ups, which will resonate into why the program succeeded or failed.

The number of successful sign-ups was examined, both independently, and as a percentage of all encountered patients in the pilot locations, using a weekly run chart to track process performance trend. Data for this analysis was retrieved from the NICAP administrative records, which contains process-tracking data.

Outcome data, the overall activation rate of MyUFHealth was analyzed using a run chart, showing pre and post-implementation. The association between the NICAP intervention and the outcome variable was analyzed using a paired t-test for test of significance, at 0.05 level of confidence. Data for this analysis was retrieved from the UFHealth EPIC database.

RESULTS

Process Evaluation

<table>
<thead>
<tr>
<th>Table 1. Summary of process measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Participants (N=633)</td>
</tr>
<tr>
<td>Successful sign-ups, n (%)</td>
</tr>
<tr>
<td>Declinations, n (%)</td>
</tr>
<tr>
<td>Already signed-up, n (%)</td>
</tr>
</tbody>
</table>
A total of 633 patients were encountered by the NICAP interns, and out of this number, 36% of these encounters were successful, (i.e patient agreed to sign up for the health portal after an encounter with a NICAP intern), 39% had already signed up for the health portal, while 25% of these encounters was not successful. (Table 1.)

Among the 25% of patients who refused signing-up for the health portal, 25% stated no other reason than they not being interested in enrolling for the electronic health portal, 18% preferred doing it at home, while another 18% stated reasons related technology. (Table 2)

Table 2. Reasons for declinations

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Total (N= 160)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not just interested n (%)</td>
<td>40 (25)</td>
</tr>
<tr>
<td>Prefer to do it at home n (%)</td>
<td>29 (18)</td>
</tr>
<tr>
<td>Technology n (%)</td>
<td>29 (18)</td>
</tr>
<tr>
<td>Interruptions n (%)</td>
<td>20 (12)</td>
</tr>
<tr>
<td>One appointment n (%)</td>
<td>17 (11)</td>
</tr>
<tr>
<td>Internet service in clinic n (%)</td>
<td>11 (7)</td>
</tr>
<tr>
<td>Proxy account n (%)</td>
<td>5 (3)</td>
</tr>
<tr>
<td>Trust Issues n (%)</td>
<td>3 (2)</td>
</tr>
<tr>
<td>Others n (%)</td>
<td>6 (4)</td>
</tr>
</tbody>
</table>
Outcome Evaluation

Fig. 1

A run-chart of the overall activated accounts in neurology clinic, over the 3 months pilot study. The orange line indicates the goal of 5% that was set by the leadership, while the blue line indicates the trend of the activated accounts over the 3 months pilot period. The point where both lines intercept indicates the time when neurology met its goal.

Table 3. Monthly activation rates of MyUFHealth in Neurology clinic

<table>
<thead>
<tr>
<th></th>
<th>Neurology Clinic</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec-16 (Baseline)</td>
<td>46 %</td>
<td>51 %</td>
</tr>
<tr>
<td>Jan-17</td>
<td>49 %</td>
<td>51 %</td>
</tr>
<tr>
<td>Feb-17</td>
<td>51 %</td>
<td>51 %</td>
</tr>
<tr>
<td>Mar-17</td>
<td>52 %</td>
<td>51 %</td>
</tr>
</tbody>
</table>

There has been a **steady increase** in the overall activation rate of MyUFHealth in both the neurology and the neurosurgery clinics over the **three months’** period of the pilot study. In terms of meeting the set goal of increasing activation rate **by 5%**, neurology met this goal after **two months** of implementing the **NICAP intervention program**, with an overall activation rate of **52%** by **March of 2017**, an increase of **6%** from baseline (fig. 1). This was **statistically significant** at alpha = 0.05 (with a **p value of 0.0009**), using the **paired t-test** for significance.
Neurosurgery clinic also met and surpassed its goal of increasing activation rate by 5%, with an overall activation rate of 42%, an increase of 10% from baseline (December 2016). Neurosurgery met its goal after one month of implementing the NICAP program (fig. 2). This was statistically significant at alpha 0.05, using the t-test for significance.

**Table 4. Monthly activation rates of MyUFHealth in Neurosurgery clinic**

<table>
<thead>
<tr>
<th></th>
<th>Neurosurgery Clinic</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec-16 (Baseline)</td>
<td>32%</td>
<td>37%</td>
</tr>
<tr>
<td>Jan-17</td>
<td>39%</td>
<td>37%</td>
</tr>
<tr>
<td>Feb-17</td>
<td>41%</td>
<td>37%</td>
</tr>
<tr>
<td>Mar-17</td>
<td>42%</td>
<td>37%</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Removing patients that were already signed up from the equation, most patients enrolled in MyUFHealth after an encounter with a NICAP intern. The success rate observed can be attributed to the extra motivation the interns give to patients. With patients seeing interns on-
site, willing to assist them in signing up for the portal, they are more likely to be motivated to enroll in the patient portal.

Additionally, several factors influenced the amount of sign-ups that were completed. Specific characteristics of interns drive the amount of sign-ups that are completed. Individual interns that are more outspoken, engaging and personable had higher successful encounters, than interns with a shy personality type. Thus, personality types should be taken into consideration, during recruitment for new interns.

Matching interns schedule to peak hours of clinic visits also played an instrumental role to the number of successful sign-ups that was observed, as interns that were located in clinic during peak hours had more successful encounters than those interns that were present during clinic down times.

Fewer patients declined signing up because of several reasons, listed in table 2 above. Among all reasons stated for not attempting to sign-up for the health portal, ‘not being interested’ in the health portal and obstacles ‘related to technology’ were two of the most commonly cited barriers to enrollment. Importantly, ‘obstacles related to trust’ were infrequently cited as contributing factors, as only 2% of participants reported not trusting the health portal.

To date, most studies have used EHR data to identify factors associated with low enrollment. These studies have cited lack of access to computers or the internet as major barriers to enrollment and hypothesized about the role of negative attitudes toward the patient portal. Other studies have examined general attitudes toward patient portals in broad patient populations and found concerns about privacy and security with the use of electronic communication which are all consistent with the results of the findings of this quality improvement study.

Those patients who were not interested in the health portal showed negative attitudes towards the patient portal, as most did not feel the portal would be useful to them. According to behavior change theorems, people tend to change behaviors if the perceived benefits of the certain behavior change outweighs the cost of sticking with the behavior. Many patients may not fully understand the features available in the patient portal they are being offered. In addition, concerns about the safety and privacy of the internet for health communications negatively influenced enrollment. Specific messages conveying the rigorous safety measures taken to secure the privacy of the EHRs may help allay concerns.

We also found several important results that may inform future efforts to expand portal enrollment and utilization, which are briefly highlighted below:

- “I am only here for one appointment and might not be coming back”

This was echoed by a significant number of patients (11%) particularly in the neurosurgery clinic. This clinic rotation is unique because of the uniqueness of the patient population it
serves. Most patients that are seen in this clinic are examined to access if they will need surgery or not, and majority feels if they’re not going to need surgery, then the chances of coming back to our health system is slim, hence do not feel a need to enroll in MyUFHealth.

Attempts should be made to convince these set of patients that although they might be here for one appointment, having MyUFHealth is useful because of the enormous benefits it provides.

- **Interruptions**

This is more of a system issue. The NICAP interns tasked with assisting patients sign-up for MyUFHealth reported being interrupted while in the process of talking to the patients about the health portal and helping them sign-up. A major source of the interruption stems from patients being called into their appointment before the successful completion of the sign-up process, and patients typically just want to go home after they have seen their physicians, and hence stalling the sign-up process.

Attempts have already been made to address this issue. NICAP interns are now aware that they can follow a patient to his or her examination room to complete the sign-up process, before an attending physician enters the room, because records have shown that a patient typically waits about 5 minutes in the examination room for his blood pressure to be taken, before a physician goes in to see him.

- **Need for a proxy account**

Children below the ages of 18 needs a parent proxy before they can be enrolled in MyUFHealth. To set up a proxy account, NICAP interns will need access to the EPIC database. At the time of this report, these interns lacked access to EPIC, and as a result, they were unable to sign up a significant amount of kids below the ages of 18.

**Recommendation**

It is recommended that efforts be made at trying to convince those patients that stated they are not interested in the health portals, as well as addressing issues related to technology and patients’ preference of enrolling at home. This recommendation stems from applying the Pareto principle, a data driven decision making principle.

**The Pareto Principle**

In times of limited resources, it is important we highlight the most important factors among a set of factors. Sometimes referred to as the 80-20 rule, the Pareto principle is the concept that 80 per cent of the results are due to 20 per cent of the causes. While the numbers themselves may vary, (80 per cent and 20 per cent are approximations). In our analysis, we used a 70-30 approximations) this principle helps separate what is called the “vital few”, from the “trivial
many”\textsuperscript{12}. When solving quality improvement issues, it is important to identify what those “vital few” are, because that is where attention need to go\textsuperscript{12}.

Applying this principle to the issue of declinations in signing up for MyUFHealth, “not interested” accounted for 26\% (cumulative percentage) of all declinations, while issues related to technology accounted for 19\% of all declinations (table 3). Adding both together, it is clear that both factors accounted for about 45\% of all declinations (fig 2). What this implies is that, if something is done about addressing “patient not being interested” as a reason for declinations (the problem) then, theoretically, 26\% of the problem will be solved, and if something can be done about addressing both “patient not being interested” and issues related to technology, then theoretically, 45\% of the problems will go away. Finally, if the issues related to “patient not being interested”, technology and patients’ preference of enrolling at home is tackled, theoretically, 70\% of declinations will be eliminated.
Table 5. Cumulative percentage of reasons for declinations

<table>
<thead>
<tr>
<th>Reasons for declinations</th>
<th>Not interested</th>
<th>Technology</th>
<th>Prefer to do it at home</th>
<th>Interruptions</th>
<th>One appointment</th>
<th>Poor internet connection in clinic</th>
<th>Proxy account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cum. %</td>
<td>26%</td>
<td>19%</td>
<td>19%</td>
<td>13%</td>
<td>11%</td>
<td>7%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Due to limited resources available to fix everything, it is important that effort be made to solve these issues in order to get the best bang for your bucks. This recommendation, however, should be interpreted with caution. Applying the 70-30 principle does not necessarily mean issues that are quick fix shouldn’t be taken care of, especially if they can be done within a short time frame, using limited resources. For example, fixing the Wi-Fi connections at the clinic location is a quick solution to the issue of poor internet service at these locations.

**Possible Ways of Getting Patients Interested in MyUFHealth**

Attempts should be made to convince those patients who stated they were not interested in *MyUFHealth* because of reasons they refused to share. One possible approach to this problem...
will be for physicians to talk about the importance of having *MyUFHealth*. Studies have shown that patients are more likely to change or adhere to a specific behavior, if their physicians suggest such behaviors\(^{13}\). Attending physicians can go a long way in influencing behaviors of their patients. Saying something along these lines “you should sign up for *MyUFHealth*, that way we can communicate more effectively, when you’re not in clinic” can go a long way in convincing patients to sign-up. More so, just wearing a small badge on their garment that says “stay in touch, sign-up for MyUFHealth today” can also go a long way.

Additionally, attempts should be made at creating a tracking and follow-up mechanism on those patients who stated they would prefer signing up at home, and a reminder email sent to these patients, to keep the motivation going.

**IMPLICATION**

**Implication on Clinical Workflow**

Few studies have examined the impact of secure messaging, a component of *MyUFHealth*, on workflow\(^{13}\). Workflow is the flow of people, equipment, information and tasks, that are used or required to support the goals of the work domain\(^{14}\). From a human factors perspective, workflow includes communication, coordination, and interacting with information, problem-solving and planning\(^{14}\). Increased *MyUFHealth* enrollment can both support workflow, for example by facilitating communication and other processes that hinder and interrupt work processes. A typical example of this in the neurosurgery clinic will be the pre-visit questionnaires that are filled by patients when they arrive for their clinic appointment. Sending patients these questionnaires prior to their visit, as soon as they get their medication number can increase efficiency and reduce wait times, and this can be accomplished when more people are enrolled in the portal.

**Implication on Clinical Outcomes (Re-admission Rates)**

Addressing the problem of unnecessary readmissions cannot be separated from an examination of the causes and perhaps surprisingly, when it comes to hospitals, one of the biggest causes is simple — communication\(^{15}\). A study presented by Harvard Business Review found that on average, a hospital could reduce its readmissions rates by 5% if it simply prioritized communication with patients while also complying with evidence-based standards of care\(^{16}\).

Patient Portals can serve as an excellent touch-point for information resources and feedback from patients after they have been discharged, as well as provide an option that can help patients stay on top of their medication, wound care, and other post-discharge responsibilities\(^{15}\).
Implication on MACRA

Signed into law April 2015, The Medicare Access and CHIP Reauthorization Act (MACRA) shifted Medicare drastically for the first time in over 10 years. With a shift from volume-based care to value-based care, physicians are forced into a new scope of practice in how they deliver care to patients; providers now face the Quality Payment program\textsuperscript{17}.

This program within MACRA determines physician reimbursement and two different paths can be pursued for this to happen. The two different tracks are Merit Based Payment System (MIPS) and Advanced Alternative Payment Models (APMs). Under MIPS, a main category to score physicians on is Advancing Care Information, formerly known as meaningful use. The scoring of this category is based on patient engagement and information exchange. Appropriate use of patient portals enables health care organizations to meet this scoring category for patient and family engagement\textsuperscript{18}.

It seems as though MyUFHealth was meant to be integrated into MACRA. With an astute focus on care coordination and patient engagement, MyUFHealth displays the same overarching goals as MACRA aims to achieve.

As MACRA continues to collect data in these first two years of the performance period, MyUFHealth helps physicians, set a higher bar and therefore increase their chances of having a higher MIPS scores. This gives them the ability to potentially get an extra percentage on top of their reimbursement. That gives them a chance to earn up to an extra 4\% within the first year (CMS, 2016). When MACRA and MyUFHealth are put together, there becomes an equal focus on patient and physician outcomes.

LIMITATIONS

The development of the study design and data analysis for this QI project was carried out with the understanding of the difference between QI research and traditional research, and as such the QI design for this project did not employ randomization nor the use of ‘blinding’. Variables such as seasonality, gender, and other external variables that might influence the outcome of this program, were not controlled.

CONCLUSION

The NICAP MyUFHealth pilot program has great prospects of increasing enrollment in patient portals, as evident in the results of this QI study. With a statistically significant result, we can conclude that the observed differences in MyUFHealth activation rates in the pilot locations isn't due to chance alone. This has great implication on both the patient and provider organization.
An increased enrollment, when accompanied with a corresponding increase in utilization, has a tendency of promoting better communication between patients and their providers. Effective communication and better self-engagement, increases patients’ self-efficacy for managing their conditions, which has great prospects for better clinical outcomes, reducing readmission rates (by helping patients stay on top of their medication, wound care, and other post-surgical responsibilities) and patient satisfaction. Because an engaged patient, is often a satisfied patient, getting more patients enrolled in *MyUFHealth* enhances the overall experience of the patient.

With additional functionalities to the portal like an integrated physician and hospital billing system, and ability of patients to pay their medical bills through the health portal, increased enrollment in MyUFHealth sets the institution in the path of attaining its mission of achieving the perfect patient experience.

**List of References**


