

UCLA

AAPI Nexus: Policy, Practice and Community

Title

Addressing Barriers in Health Equity through Innovations in Health Information Technology: A Health Center's Experiences in Implementing a Chinese Language Patient Portal

Permalink

<https://escholarship.org/uc/item/53z1f3tq>

Journal

AAPI Nexus: Policy, Practice and Community, 12(1-2)

ISSN

1545-0317

Authors

Mei, Christopher

Kim, Esther B.

Sherman, Lynn

et al.

Publication Date

2014

DOI

10.17953/appc.12.1-2.q721j63114413h14

Copyright Information

This work is made available under the terms of a Creative Commons Attribution-NonCommercial-NoDerivatives License, available at <https://creativecommons.org/licenses/by-nc-nd/4.0/>

Peer reviewed

Practitioners' Essay

Addressing Barriers in Health Equity through Innovations in Health Information Technology:

A Health Center's Experiences in Implementing a Chinese Language Patient Portal

Christopher Mei, Esther B. Kim, Lynn Sherman,
Shao-Chee Sim, Kai Yeung, Candy Poon,
Maggie Wong, and Nick Egleson

Abstract

Patient portals have the potential to empower patients to be more knowledgeable and proactive about their health. Implementation of patient portals has become increasingly critical at primary care sites that serve underserved communities, where there is a growing need for linguistically appropriate electronic access. The Charles B. Wang Community Health Center has recently developed a linguistically appropriate patient portal with the goal of providing increased access to its majority Chinese American patient population with low English proficiency and literacy levels. This article will discuss experiences learned from implementing a Chinese Language Patient Portal that addresses socioeconomic barriers and disparities in health care access.

Introduction

The Patient-Centered Medical Home (PCMH) has been increasingly promoted as a model of improved care that may address many of the failures and delivery gaps within the current primary care system. Medical homes are highly integrated, team-based practices that promote patient-centered care through routine patient feedback and better access. Central to the medical home concept is the use of electronic medical records (EMR), and build-

ing upon electronic health record innovations and health information technology (HIT) is crucial in providing higher quality care and improving health outcomes. Meaningful Use and PCMH goals have acknowledged patient portals as key platforms in improving access to health care and prompting various efforts around improving patient engagement, such as access to medical records, communication with providers, education, and wellness tracking.

Disparities in provider–patient communication have been shown to exist among Asian Americans, especially those who are of low income and have limited English proficiency (LEP) (Ngo-Metzger et al., 2010). To address this, the Charles B. Wang Community Health Center (CBWCHC) has launched a Chinese Language Patient Portal (CLPP) with funding in part by the New York Community Trust. The patient portal is a secure website that gives patients convenient 24-hour online access to their personal health information from anywhere with an Internet connection. Services provided in the portal include allowing patients to access their health records, review lab results, schedule appointments, refill medications, and communicate with their health care providers. Launched in December 2013, the CLPP provides services in Chinese (both traditional and simplified) and is available in addition to the original English platform that was released in July 2013.

In this article, we cover the rising interests in developing HIT for addressing health equity, experiences, and lessons learned in designing and implementing the CLPP, as well as guidance for other health centers as they consider developing their own patient portals that address the unique cultural and linguistic needs of other patient populations.

Background

History and Scope

The CBWCHC is a federally qualified health center (FQHC) that provides comprehensive medical and support services to medically underserved Asian Americans and other vulnerable populations in the New York metropolitan area. In 2013, CBWCHC served over forty-seven thousand patients, of whom ninety-five percent were Asian American, predominantly Chinese Americans, and eighty-nine percent were best served in a language other than English (CBWCHC, 2014). With site locations in Chinatown, Manhattan, and Flushing, Queens, CBWCHC strives to deliver

comprehensive and affordable health care to the Asian American population in the New York metropolitan area.

Linguistically appropriate electronic access at FQHCs is particularly significant for the patient population served by the CBW-CHC, since Chinese Americans in New York City experience disparities in a number of health issues, including cancer, hepatitis B, tuberculosis, and heart disease (Ghosh, 2003). Asian American New Yorkers in general face major socioeconomic barriers that have implications for health access. Nearly half of New York City's Asian Americans speak English "less than very well," indicating high rates of LEP. LEP was even higher for Chinese Americans, at fifty-nine percent. In addition, more than a third of Asian Americans in New York City have less than a high school diploma and fifteen percent live below the poverty line (U.S. Census Bureau, 2011).

Impact of Electronic Patient Portals

Positive outcomes of electronic patient portals have been documented in the literature and point to potential benefits for patients, providers, and health care institutions. These outcomes range from enhanced provider communications and improved adherence to treatment for patients with chronic illnesses to benefits to workflow systems and patient services at health care institutions, such as a slower rise in telephone contacts of patients and reduced number of office visits (Ammenwerth, Schnell-Inderst, and Hoerbst, 2012; Zhou et al., 2007). Exploratory research has shown positive attitudes among physicians who communicate via e-mail with their chronically ill patients (Patt et al., 2003). While these studies did not show improved health outcomes that were statistically significant, one study of patients with heart failure showed improved adherence to medical advice, which is important to disease management, among patients with access to an online medical record.

Addressing the Digital Divide

With rising emphasis on health technologies and efforts to increase access for patients, there is also potential for a deepening of the digital divide for disadvantaged population groups in the United States. Less-computer-literate or less-motivated patients may not be interested in patient portals (Weingart et al., 2006). In one of the few studies among disadvantaged populations, the odds of receiving an access code and using portals repeatedly were significantly

higher for whites, English speakers, and the insured. Continued efforts to ensure equitable access and benefits of these technologies by disadvantaged groups were recommended (Ancker et al., 2011).

Although patient portals have great potential to provide access to services, not all eligible patients will enroll or utilize all of the available functions. Patients who have limited access to the Internet and have low “e-literacy” levels are less likely to enroll in a patient portal (Sarkar et al., 2011). Most of the current patient portals are only available in English and do not address the needs of many populations served by FQHCs. Information on developing non-English patient portals—particularly patient portals in non-Romance languages—and portals targeted toward patients with LEP are scarce. At the same time, patient portals are becoming increasingly critical at primary care delivery sites, including FQHCs that address underserved communities and where there is a growing need for linguistically appropriate electronic access. If developed with cultural and linguistic appropriateness in mind, innovative online projects such as patient portals may be effective in addressing barriers to health care. Development of CBWCHC’s CLPP aimed to directly address this need for appropriate health care tools for LEP patients, and its implementation hopes to empower patients to become more knowledgeable and proactive about their health.

Planning and Project Management

In 2013, CBWCHC first designed and developed an English Language Patient Portal through the portal vendor Kryptiq. CBWCHC, where over two hundred and twenty-five thousand annual primary care visits are provided in Mandarin or Cantonese, then received a year-long grant from the New York Community Trust to develop a distinct patient portal that can be accessed and utilized in Chinese. In this section, we highlight the project’s major planning activities in implementing the CLPP.

Kick-Off and Formation of an Interdepartmental Planning Committee

Although implementing portal technology often falls within the responsibility of the information technology (IT) department, a wide range of different departments collaborated on the CLPP. An interdisciplinary project team comprised of health educators, IT professionals, evaluators, and administrators collaborated to de-

velop and review the portal to ensure that services were easily accessible, culturally sensitive, and conducive to producing positive health outcomes. Monthly project team meetings were conducted where members at different stages of implementation shared their updates, challenges, questions, and advice. At the beginning stages of the project, a workflow plan was developed with feedback from the project team staff, indicating specific staff, resources, and expected deadlines needed for each project step. The tools and feedback generated at these meetings provided the project team members with the confidence to push ahead in their endeavors.

Baseline Assessment

Before the CLPP launched, the research and evaluation department assessed baseline Internet use among current CBWCHC patients who would have portal access. Survey items were added to the biannual Patient Satisfaction Surveys administered in patient waiting areas of internal medicine, women's health, and pediatrics departments.

Results indicated that Internet use was very high (84%) and frequent (67% reported daily use). Chinese was the preferred language for reading (75%), with a majority favoring simplified over traditional characters. On average, those surveyed reported feeling more than "moderately comfortable" using the Internet on common Internet-related tasks, suggesting a fairly strong Internet proficiency. However, a steady proportion reported very low proficiency across tasks. For instance, while nearly half reported feeling "very" or "extremely" comfortable e-mailing, 14% were "not at all comfortable." Results helped to inform the design and implementation processes so that adjustments could be made during the project period. For example, although CBWCHC had primarily used traditional characters in its translated materials and had initially planned for a CLPP in traditional characters, the project team decided to develop two Chinese versions, traditional and simplified.

Design and Construction

Other than language, the design, format, and available features of the CLPP were identical to the English version, which was constructed and launched several months earlier. Both portals allowed users to request appointments, medication refills, referrals, and laboratory test results; view medical summaries; and send or

receive messages with providers. Parents or legal guardians of pediatric patients were able to use the portal for any of their children under the age of thirteen.

In preparation for the launch of the CLPP, the health education department worked closely with the IT department to translate all of the text displayed in the portal into Chinese and continued to review and refine translations for appropriate levels of health literacy, quality, and clarity for patients. Although the Chinese version of the portal was not tested for cultural compatibility with the English version prior to release, health education staff noted and considered areas of health literacy and translation quality during the translation process. IT staff continued to identify the language-dependent features that impaired or enabled usability in a patient portal. These features included explanatory text, dropdown options, help screens, and user feedback screens. The IT department was able to change most of the text in the portal into Chinese, but there were some areas that could not be altered due to the software limitations of Kryptiq's portal. For example, the patient's medical summary in the portal comes directly from the English electronic medical record (EMR). Kryptiq currently lacks the capability to convert English text into Chinese characters; therefore, the medical summary report is currently available only in English. Other issues included an inability to incorporate Chinese characters into the medical summary report, EMR messages, and some section headers, titles, and dropdown menus.

The project team continued to document software limitations, needs, and issues that were specific to adapting a patient portal to the Chinese language. The extent of some of these limitations can vary, depending on the portal vendor and the electronic health record system used.

Prelaunch External Review and User Feedback

The project team actively engaged its patients and frontline staff to provide review and feedback on a nearly completed test version of the CLPP. Research and evaluation, IT, and health education staff worked closely with unit managers to conduct a focus group of Chinese-speaking patients to gather feedback on users' experiences, particularly on clarity, ease of navigation, and task completion, based on a user testing session (see Table 1 for a summary of results). During the review and feedback phase, IT de-

partment staff continued to consult with unit managers to obtain feedback on ways to streamline implementation of the CLPP.

In response to feedback from patients and frontline staff, the project team continued to make adjustments to the portal design and layout, including increasing the text size for improved readability and working around the structural limitations of the portal platform as much as possible to insert Chinese. The project team also documented needed changes to the portal platform in order to advocate on behalf of the patient population to the portal vendor.

Implementation

Launch

In December 2013, five months after launching the English Language Patient Portal, the CLPP went live in both traditional and simplified Chinese. The project team planned several activities in preparation for the launch. Activities included training IT department support staff, developing marketing materials to promote the new CLPP, and planning patient workshops on how to use the portal.

Coinciding with the launch, CBWCHC hosted a press conference with members of the Chinese press and a separate briefing session with a small group of key stakeholders in order to promote the launch of the portal and to demonstrate the services and capabilities it offered. The project team believed it was an important milestone to publicize and engage local media outlets, funders, and stakeholders. The goal of these events was to engage the larger community and raise awareness that a personal health technology which was linguistically and culturally appropriate to the Asian American population was available and continues to be developed, with the larger picture of encouraging patients to engage and be more actively involved in their care as the motivation for developing a linguistically appropriate portal. The health education and marketing staff coordinated the press event and developed press packets for reporters.

In addition, CBWCHC launched a consumer education program to teach patients the benefits of the portal and how to use it to better understand and manage their own care. To promote the launch of the portal and the availability of education workshops, an extensive marketing campaign was coordinated by the CBWCHC's health education department. It involved distribution of informational flyers, placement of marketing posters at CBWCHC's various site locations, and newsletter announcements.

Postlaunch User Feedback Review

The planning committee continued to meet regularly to monitor progress and identify needs. In order to collect feedback from users on clarity and ease of navigation through the new portal, the team conducted a patient survey. IT staff integrated a Chinese-language survey, which included the ability to receive comments in Chinese, by putting the survey on a separate server and providing a web link from the portal screen.

Three months after the launch of the CLPP, we asked patients to take the web-based survey by logging into the portal. The survey was announced via mass e-mail to registered users, and it offered an incentive: a gift card by random drawing. The incentivized survey also helped promote the CLPP during patient portal workshops and through flyers posted in patient waiting areas of the Health Center. Informal staff feedback indicated that many new patients signed up for the first time as a result of the flyers. The survey also served to remind and encourage patients who had registered but had not utilized its services.

Over a span of two weeks, CBWCHC received survey responses from seventy-five CLPP users. The majority of respondents were female (72%), and their average age was forty years old, though respondents in their thirties being the most common. The majority of respondents were users of the traditional Chinese version (84%). Among the various features available in the CLPP, the top reason for respondents' use of the portal that day was to view their medical summary (55%). About a quarter were just browsing. Frequency of use varied, but for 40%, this was their first time using the CLPP. On the other end, about 12% had used it six or more times, averaging about two portal visits per month since its launch. On a four-point scale from "Poor" to "Excellent," most respondents gave a positive rating of their use that day; 75% gave a rating of "Good" or "Excellent" (see Table 2).

Most agreed or strongly agreed that the portal is easy to learn to use (79%), they can find information they need quickly (79%), and easy to understand (71%) (see Figure 1). As high as 68% agreed or strongly agreed that using the CLPP has helped them to be more active in their health care. Sixty percent agreed or strongly agreed that use has improved communication with the provider's office (see Figure 2). The majority of comments recommended having a

portal fully translated into Chinese, particularly at least some degree of medical reports. A thirty-two-year-old female patient wrote in Chinese, "It would be better if there was a Chinese version of the medical report. Many medical terms in English are not easy for people whose English level is low."

Results indicate an overall positive experience and help identify areas that may need improvement. Female adults in their twenties and thirties were the dominant users, which might help inform ongoing outreach efforts to target a specific demographic to promote use. Thirty-seven percent of female survey respondents in their twenties and thirties were users who also accessed it for one or more patients, which might include children or other family members such as an elderly parent. Consistent with the statistics we've seen on portal utilization, viewing medical summaries and reports are common reasons why patients use the patient portal and continued efforts are needed to make this information more understandable to LEP patients. Results indicate that the portal is fairly easy to navigate and understand. At early implementation, there is a promising indication that patients are seeing benefits of use, such as becoming more active about their health and improving communication with their medical home.

Sustainability and Evaluation

Roadmap Documentation and Dissemination of Results

To address sustainability, one long-term goal of the project was to produce and disseminate a guide to assist other health centers to create portals in other languages. To accomplish this, the CBWCHC project team composed a roadmap that documented experiences with implementing and developing the CLPP, limitations that need to be addressed, as well as suggestions for other health centers in developing their own personalized project work plans.

Along with sharing the project roadmap with other health centers, the stages and lessons learned from the project will also be presented at national health care forums and webinars to demonstrate the results, discuss the development and implementation processes, and share lessons learned by the project team. In particular, a presentation on the development process of the portal was presented at the Alliance of Chicago User Conference held on May 7–9, 2014. The presentation was attended by an audience of providers, administrators, and developers. It was well received and

generated several discussion questions afterward involving next steps and the development process. Several health centers reached out to CBWCHC regarding the sharing of the project roadmap.

Evaluation

Through a mixed-methods evaluation approach of both process and outcomes, we gained a better understanding of the experiences of patients and staff, and identified successes, challenges, and lessons learned from adopting a CLPP.

Positive Patient Experiences

An early Patient Satisfaction Survey (n=606), taken one month after launching the CLPP, indicated that patient satisfaction in scheduling appointments and accessing health records at CBWCHC was high and comparable among both users and nonusers of the patient portal. The postlaunch user feedback survey described earlier (Table 2) shows a high overall rating of the CLPP among users.

Front desk receptionists and managers interact with patients most on portal-related matters. Their feedback on the CLPP was captured through a focus group with seven staff participants, during which they highlighted the convenience and enhanced access the CLPP gave patients to make requests for medication refills, lab results, medical summaries, or appointment scheduling at any time, instead of calling or traveling to CBWCHC. Staff reported that parents of pediatric patients find the medical summaries especially useful, as they need frequent access to their children's health records for school-related forms. Some patients are actively using the patient portal to view test results for time-sensitive health concerns, such as testing for sexually transmitted infections. Through the portal, patients are able to request test results from their provider, who will then electronically send requested information to the patient through the portal after pulling data from the EMR. Electronic access to health records can facilitate care coordination across multiple providers. For a patient population with little leisure time, long work hours, and other priorities that often supersede a visit to the doctor's office, such conveniences can be welcome. Of all requests made by patients through the patient portal, lab test results are the most frequent, which indicates the usefulness and appeal of this feature among our patients. Focus group participants noted ways the CLPP has enhanced communication between patients and providers. For example, the portal's messag-

ing feature created a new channel to reach patients who were less responsive to phone calls.

In another focus group, project team staff from the IT and health education departments identified major successes. First, CB-WCHC created and implemented one of the first CLPPs. In addition, activities surrounding CLPP generated interest in this type of health technology among patients. The press conference that was hosted in December was widely reported on by the Chinese media, with community interest rising especially among existing patients of the Health Center. Many existing patients requested additional information on how to enroll in the Chinese portal, following the posting of health education materials and hearing news about the portal after the press conference. The formal presentation given at the Alliance of Chicago User Conference generated interest among developers to brainstorm ways to use linguistically appropriate technologies in workflows. As the patient experience was identified as being key to tailoring linguistically appropriate technology platforms, developers at the conference have continued to be in discussion on how to capture experiences with usability, suggestions for improvement, and challenges with implementation and development.

Challenges for Patients

Despite a high rate of patient registration into the patient portal, all focus groups with staff identified barriers and challenges to portal use that still persist and highlighted areas needed for improvement to close these gaps. During focus groups, front desk staff and unit managers noted patients who refused the portal tended to be LEP, have lower computer literacy, have lower educational attainment, be elderly, or be busy with competing priorities, such as work or child care.

As mentioned earlier, the limitations of the portal software mean that various portal features are fully not available in Chinese and, therefore, language barriers for many LEP users remain. All staff focus groups noted that the initial log-in process, which is necessary to activate portal registration, is confusing and difficult for many patients because the instructions for this process are currently only in English. This process involves entering a temporary password, creating a new password, and selecting a security question. These steps can be difficult and confusing for the less computer-savvy user and even more so for LEP populations.

Problems encountered during this process generated a large share of portal-related phone calls or requests to staff. Staff noted that although these may be seen as minor glitches, multiple and/or frequent instances can be enough of a barrier to deter a patient from continuing in the process. Unfortunately, this instruction page is automatically generated by the portal software, and the template is unable to be altered to add Chinese text.

Challenges for Staff

All focus groups with staff indicated added workload and lack of manpower as challenges during the initial implementation of the patient portals. Front desk receptionists and managers handle a wide range and large volume of patient requests and services. The main challenge cited was limited time and/or staff to handle portal-related requests or issues in addition to educating patients about the portal and registering them. Although staff acknowledged the benefits of a patient portal, they noted a lot of staff time was spent on addressing technical problems that patients encountered, in person and by phone, especially when they went home to log into the portal for the first time. In hindsight, launching the English and Chinese versions of the portal at different times presented some challenges because it required staff to register patients each time. Separate registration was time consuming for staff, and potential CLPP users may have been missed during English portal registration when the CLPP was not yet available.

Suggestions for Improvement

The staff focus groups generated valuable suggestions based on their cultural and linguistic competency and experiences grounded in interactions with patients. Recommendations covered practical changes as well as larger policy changes needed.

Staff noted that the features of the portal that allow patients to message providers, access medical summaries, and request lab test results were potentially very useful and appealing to patients but currently limited because they were not fully available in Chinese. Having these features fully functional in Chinese (e.g., able to transmit messages in Chinese) would greatly enhance the patient portal in the future.

Staff emphasized the need to streamline the patient's initial log-in process. For example, staff suggested providing patients with instructions translated into Chinese and further explaining

technical instructions in simpler terms to aid LEP or less-computer-proficient users.

More patient education is needed to explain what a patient portal is, how to log in and use the portal, and what its benefits are. In addition to existing patient workshops, staff suggested having a short video tutorial available from the portal's homepage or playing in patient waiting areas for added convenience and access from home or while they wait for their appointments (see Table 3 for an outline of challenges and suggestions for improvement).

Lessons Learned

Having a culturally and linguistically competent team of staff, particularly a health education department able to provide in-house translation was critical to the CLPP's smooth implementation. In addition, having an EMR system that is well established and integrated into the Health Center's operations and workflows was a big advantage. Having adapted an EMR system since 2005, CBWCHC staff were already familiar with using an electronic system; this greatly facilitated the adoption of patient portal technology. Administrative support of the project further enhanced its success.

In terms of planning and implementation, the implementation was labor intensive for staff and required more time for patient education, promotion, and troubleshooting among already busy staff, particularly for front desk receptionists. The project team found that launching both English and Chinese versions simultaneously may be less labor intensive for staff and allow for more coordinated and focused patient engagement efforts.

Lastly, staff emphasized that achieving meaningful use through adopting a patient portal may not be as "meaningful" if patients are not using it and taking advantage of its benefits. Staff emphasized the need for active and ongoing promotion and education of patients going forward for continued success of the portal. In addition, simply translating medical information into Chinese may not be useful to portal users; rather interpretation into plain language may be more important. For example, an LEP patient may not understand what a hemoglobin count number means for his or her health, even if translated into Chinese; interpreting the result into understandable terms, such as, "Your blood glucose level is normal," may carry more impact and be of more use for patients.

Implications and Limitations

A major limitation during the design phase of the Chinese patient portal was the existing programming software platform provided by Kryptiq. While many of the features of the original English language patient portal were able to be translated into Chinese characters, the actual generated medical record that patients see in the portal remains in English. According to the Health Center's chief medical officer,

The portal will improve communication between Health Center patients and their providers, and encourage patients to become more actively involved in their own care. This will improve the quality of care and quality of services for our patients. Unfortunately, the technology does not have the capability at this time to handle Chinese language needs. Our patient portal is only a small step and needs to be improved, but we hope that GE and other technology companies will take notice and support further developments in HIT that can be adapted for Chinese language users.

Along with the technological limitations of the portal software, other barriers to patient use of the portal revolve around issues with access. Low computer or Internet proficiency may hinder the experience of some patients in navigating the features of the portal (Ngo-Metzger et al., 2010). In the case of the CBWCHC portal project, it is less likely that patients with limited access to the Internet and low e-literacy levels will enroll in the portal. Physicians have also reported concerns that permitting patients to view elements of their medical records may also create subsequent patient confusion, worry, and misinterpretation (Wald et al., 2004). Moreover, many physicians resist permitting patients to contact them directly, outside of planned clinical encounters.

While health IT developments such as patient portals have the potential to facilitate communication between patients at risk for health disparities and their providers through greater patient engagement, there is also a potential that health IT may exacerbate health disparities, such as language, health literacy, technical literacy, and access to technology, if not addressed. Digital disparities may also persist among older adults, other racial and ethnic minorities, physically disabled patients, and lower income patient populations.

Given the promise of HIT as an enabling tool for improving quality of care and health outcomes, especially in vulnerable populations, the documented experiences of the CBWCHC project team is an important early step in identifying areas for further technical improvements and developments.

Next Steps

Health literacy remains a significant problem and barrier to the delivery of quality health care (Committee on Health Literacy, 2004). Of the 3.5 million Chinese Americans counted in the 2010 U.S. Census, more than eighty-two percent speak Chinese at home, and more than half report they speak English less than very well. For all languages, more than 55 million Americans over five years of age speak a language other than English at home, and 24 million of these speak English less than well. This represents eight percent of the total population who could face language barriers to quality health care. The replication of electronic health record patient portals in languages other than English has potential to provide benefits and assistance for these high-risk groups susceptible to low health literacy, such as minorities, immigrants, and persons with limited education (Frimpong et al, 2013). Consistent with the goals of the PCMH, promoting patient engagement through tools such as linguistically appropriate patient portals is a key step for maintaining the importance of individual patient needs in receiving care services. Through development of the CLPP, CBWCHC has made an effort to address the importance of patient-centered care and has provided a blueprint for other health centers to refine and refer to as they consider developing their own patient-centered tools.

To get the most value from the availability of patient portals, practices will need to invest time and resources into training and preparation activities. Particularly in the area of patient education, further programs are needed to explain what a patient portal is, how to log in and use the portal, and to demonstrate ease of use and convenience. In addition, continuous evaluation and sustainability efforts are a key factor in the improvement of current systems. As highlighted through the CLPP project, integrating evaluation measurement tools such as biannual Patient Satisfaction Surveys are a useful means of collecting needs assessment and other patient data with minimal disruption to patients and staff in the waiting areas. However, survey items should be clear and few so

as not to make the existing survey longer than necessary for the patient. Moving forward, incorporation of staff satisfaction surveys may also provide a tool to identify and document issues after implementation of a new portal or technology. Further evaluation efforts can explore the association between the potential benefits of non-English patient portals, such as improved systems efficiency and communication, and measurable health outcomes, as we report in this article. In addition, continued marketing and promotion efforts should be planned in order to facilitate sustainability efforts.

The utilization of language appropriate patient portals has the potential to address areas of health disparities, such as health literacy, access to health care services, and quality of care, by increasing means of access and communication for patients and providers to patient health records. This means delivering scheduling, health education, test results, secure provider communications, and clinical documents in an intuitive interface in which there are no impediments due to language. CBWCHC's CLPP project had the immediate goal of creating a patient portal that serves Chinese-speaking patients just as well as it serves their English-speaking counterparts. With the long range goal that the project will help other health centers create portals in languages other than English, the lessons learned from CBWCHC's CLPP can serve as reference point for further developments in HIT continue to progress.

Acknowledgements

The CLPP team at CBWCHC would like to extend special appreciation to the New York Community Trust for its contribution as funder for the portal project.

References

- Ammenwerth, Elske, Schnell-Inderst, Petra, and Alexander Hoerbst. 2012. "The Impact of Electronic Patient Portals on Patient Care: A Systematic Review of Controlled Trials." *Journal of Medical Internet Research* 14(6): e162.
- Ancker, Jessica S., Barron, Yolanda, Rockoff, Maxine L., Hauser, Diane, Pichardo, Michelle, Szerencsy, Adam, and Neil Calman. 2011. "Use of an Electronic Patient Portal among Disadvantaged Populations." *Journal of General Medicine* 26(10): 1117–23.
- Charles B. Wang Community Health Center. 2014. "Uniform Data System Report 2013." Submitted Report, March 6, 2014.

- Committee on Health Literacy Board on Neuroscience and Behavioral Health. 2004. "Health Literacy: A Prescription to End Confusion." Institute of Medicine of the National Academies (IOM).
- Frimpong, J., Jackson, B., Stewart, L., Singh, K., Rivers, P., and S. Bae. 2013. "Health Information Technology Capacity at Federally Qualified Health Centers: A Mechanism for Improving Quality of Care." *BMC Health Services Research* 13: 35.
- Ghosh, Chandak. 2003. "Healthy People 2010 and Asian Americans/Pacific Islanders: Defining a Baseline of Information." *American Journal of Public Health* 93(12): 2093–8.
- Healthcare Information and Management Systems Society (HIMSS). 2010. "Leveraging Health IT to Achieve Ambulatory Quality: The Patient-Centered Medical Home." National Committee for Quality Assurance (NCQA). https://www.ncqa.org/Portals/0/Public Policy/HIMSS_NCQA_PCMH_Factsheet.pdf (accessed March 3, 2014).
- Ngo-Metzger, Q., Hayes, G.R., Chen, Y., Cygan, R., Garfield, C.F. 2010 "Improving Communication between Patients and Providers Using Health Information Technology and Other Quality Improvement Strategies: Focus on Asian Americans." *Medical Care Research and Review* Oct(67):231S-24S, first published Jul 30.
- Patt, Madhavi R., Houston, Thomas K., Jenckes, Mollie W., Sands, Daniel Z., and Daniel E. Ford. 2003. "Doctors Who Are Using E-mail with Their Patients: A Qualitative Exploration." *Journal of Medical Internet Research* 5(2): e9.
- Sarkar, Urmimala, Karter, Andrew J., Liu, Jennifer Y., Adler Nancy E., Nguyen, Robert, Lopez, Andrea, and Dean Schillinger. 2011. "Social Disparities in Internet Patient Portal Use in Diabetes: Evidence That the Digital Divide Extends beyond Access." *Journal of American Medical Informatics Association* 18(3): 318–21.
- U.S. Census Bureau. 2011. "2011 American Community Survey 5-Year Estimates." Infoshare. <http://www.infoshare.org> (accessed December 16, 2013).
- . 2010. "2010 Decennial Census." Infoshare. <http://www.infoshare.org> (accessed December 16, 2013).
- Wald, J.S., Middleton, B., Bloom, A., Walmsley, D., Gleason, M., Nelson, E., Li, Q., Epstein, M., Volk, L., and D.W. Bates. 2004. "A Patient-Controlled Journal for an Electronic Medical Record: Issues and Challenges." *Medinfo* 11: 1166–70.
- Weingart, Saul N., Rind, David, Tofias, Zachary, and Daniel Z. Sands. 2006. "Who Uses the Patient internet Portal? The PatientSite Experience." *Journal of American Medical Informatics Association* 13(1): 91–5.
- Zhou, Yi Yvonne, Garrido, Terhilda, Chin, Homer L., Wiesenthal, Andrew M., and Louise L. Liang. 2007. "Patient Access to an Electronic

Health Record with Secure Messaging: Impact on Primary Care Utilization." *American Journal of Managed Care* 13(7): 418–24.

Appendix

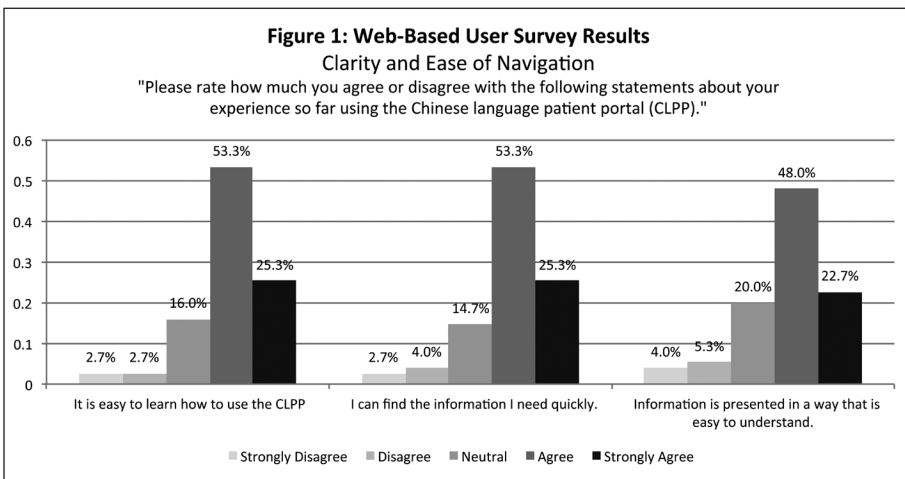
Table 1: Prelaunch User Feedback Focus Group Results	
Highlights	
<ul style="list-style-type: none">• The portal is useful and easy to navigate.• The portal provides direct and immediate communication with doctors.• The portal's functions, such as medication refill request and medical summary, are useful.• The option to review a request before submitting it was useful.	
Suggestions for Improvement	
<ul style="list-style-type: none">• Increase the font size.• The messaging feature would be useful if users could transmit and receive messages in Chinese characters.• The Health Center can use the messaging function to send information, such as flyers on upcoming programs or events.• Provide workshops or tutorials for patients to learn how to use the patient portal.• Currently, portal users need to find and select their doctors from one long list of all doctors across three site locations. Separating the list of doctors by site location would help users locate their doctors faster.• Medical summaries would be more useful if they were provided or translated into Chinese.	

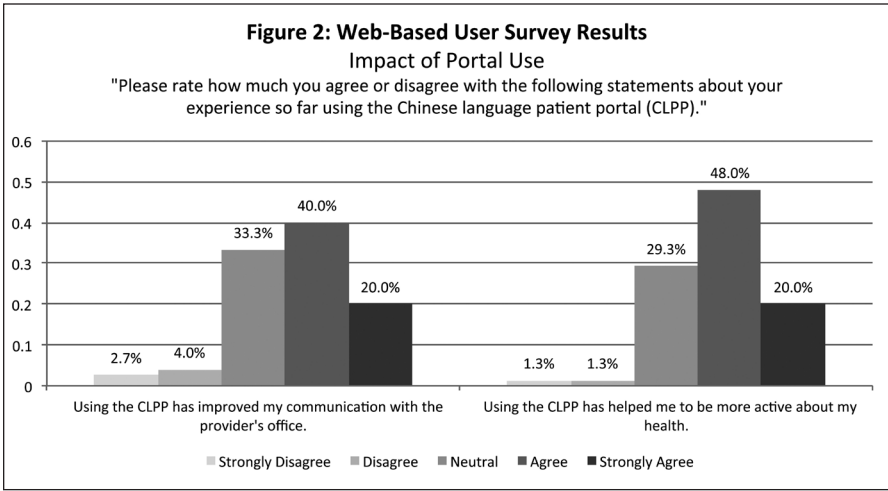
Table 2: Web-Based User Survey Results

Demographic Summary

Answer Options	Percent (Count)
Sex	
Female	72.0% (54)
Male	28.0% (21)
Age	
Average (range) in years	40 (21 to 81)
II. Portal Utilization and Experience	
Answer Options	Percent (Count)
Portal Version Used	
Traditional Chinese	84.0% (63)
Simplified Chinese	16.0% (12)
Which of the following describes your primary purpose for using the portal today? (Select one only)	
View medical summary	54.7% (41)
Browse only	22.7% (17)
View messages in inbox	6.7% (5)
Request medication refill	5.3% (4)
Request test results	5.3% (4)
Request appointment	1.3% (1)
Other (specify):	4.0% (3)
Were you able to complete the purpose of your visit today?	
Yes	82.7% (62)
No	17.3% (13)
How many times have you used the Chinese language patient portal so far?	
Today is my first time	40.0% (30)
2 times	18.7% (14)
3 times	20.0% (15)
4 times	2.7% (2)
5 times	6.7% (5)
6 or more times	12.0% (9)
How would you rate your overall experience today using the Chinese language patient portal?	
Excellent (4)	22.7% (17)
Good (3)	52.0% (39)
Fair (2)	20.0% (15)
Poor (1)	5.3% (4)

Table 3. Challenges and Suggestions for Improvement		
Challenges for Patients	Challenges for Staff	Suggestions for Improvement
<p>Socioeconomic barriers:</p> <ul style="list-style-type: none"> • LEP • Low computer literacy • Lower education • Elderly • Competing priorities (e.g., work schedules) <p>Not all features were able to be fully translated into Chinese:</p> <ul style="list-style-type: none"> • Troubleshooting initial log-in process generated phone calls and need for staff assistance. • Minor glitches over time can discourage or deter patient use. 	<p>Initial implementation:</p> <ul style="list-style-type: none"> • Limited manpower at front desk reception to meet demands for education and technical troubleshooting. • Separate registration into English and Chinese portals at different times was time consuming. • Separate registration into English and Chinese portals meant that potential users of the Chinese language patient portal may have been missed. 	<p>Practical adjustments:</p> <ul style="list-style-type: none"> • Provide patients with a translated version of the initial log-in process instructions. • Further explain technical instructions in simple language. • Provide more patient education. • Short educational or instructional video tutorial(s) about using the portal can be posted to the portal's homepage or played in patient waiting areas. These can encourage use and provide a first line of virtual technical assistance. <p>Policy considerations:</p> <ul style="list-style-type: none"> • Advocate for and communicate the need for portals with full functionality in Chinese.





CHRISTOPHER MEI, MPH, is assistant administrator at CBWCHC in New York City, where he assists in the oversight of operations and administration activities across the Health Center's different sites, coordinates management of new and existing grant programs, and works on various HIT development projects at the Health Center. He holds a Master of Public Health from the University of Rochester School of Medicine and Dentistry.

ESTHER KIM, MPH, is women's health program manager at the CBWCHC in New York City, where she manages grants of the women's health department. Previously, she was a research and evaluation associate at CBWCHC during which she conducted various research and evaluation activities in areas such as the Chinese language patient portal, patient navigation, and early childhood development. She holds a Master of Public Health from Columbia University.

LYNN D. SHERMAN, MBA, is chief financial officer at CBWCHC, where she is responsible for the financial operations, human resources, facilities, management information systems, and administrative staff. Prior to joining CBWCHC in 1995, Ms. Sherman previously worked as budget director for Beth Israel Health Care System and at St. Luke's/Roosevelt Hospital Cen-

ter as an administrator of budget and reimbursement. Ms. Sherman holds an Master of Business Administration from Cornell University's Graduate School of Management and a Bachelor of Arts from SUNY Binghamton.

SHAO-CHEE SIM, PhD, MPA, is the chief strategy officer of CBWCHC in New York City. In addition to assisting with grants management, patient experience survey, quality improvement, and strategic planning efforts, he leads research and evaluation activities of CBWCHC's disease prevention, intervention, and health service projects. Sim holds a PhD in Public Policy from the Lyndon Baines Johnson School of Public Affairs at the University of Texas at Austin and a Master in Public Administration from the John F. Kennedy School of Government at Harvard University.

KAI YEUNG is director of IT at CBWCHC, where he oversees all IT systems and applications at the Health Center, monitors the implementation of technology enhancement projects, monitors compliance with IT policies, and manages technology expansion activities. He holds a Bachelor of Science in Electrical Engineering and a Graduate Certificate in Image Processing from NYU Polytechnic University.

CANDY POON is senior IT analyst at CBWCHC. Ms. Poon has been working at CBWCHC since 2004. As the technical lead developer of the Health Center's website, she helped develop the Patient Portal in multiple languages (English, traditional Chinese, and simplified Chinese). She holds a Bachelor of Science in Computer Science and Mathematics from CUNY College of Staten Island.

MAGGIE WONG, MPA, is manager of marketing programs at the CBWCHC since 2001. She works with the health education team to provide health education workshops and translation services, and promotes Health Center services and programs to the community, as well as coordinates with the ethnicity to disseminate health related information such as Hepatitis B initiatives, Affordable Care Act health insurance marketplace enrollment outreach, and patient portal education workshops.

NICK EGLESON is president and founder of Paladin Consulting and Programming in New York City, where he works as consultant for various organizations to develop strategies in HIT innovation, enterprise reporting, and implementation of new IT tools.