

# **Redesign and Streamline the Refill Process for MyBoynton Patient Portal**

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## Introduction

In recent years, patient portal functionality has become more robust (Osborn et al., 2013). Portals are not only allowing patients to perform the tasks described previously, but they also allow patients to receive generic health information and personally relevant health information (Ross et al., 2006), be coached on how to communicate with providers before medical appointments and manage medication lists (Turvey, 2012) among other medication management tasks.

The University of Minnesota Boynton Clinic has a well-established patient portal, MyBoynton patient portal (Fig.1), which provides users with several features, including scheduling appointments, emailing the healthcare team, and viewing immunization records (MyBoynton patient portal, 2023). The portal is accessible to University of Minnesota students, faculty, staff, and alumni via their U of M Internet ID -- also known as an x500 ID. Besides, the doctors and nurses who work at Boynton Clinic have access to the patients' portal as well. However, the portal's refill function, Rxlocal Patient Portal (Fig.2), is separated from the main website. This lack of integration between MyBoynton's main system and the refill system could potentially cause several issues.

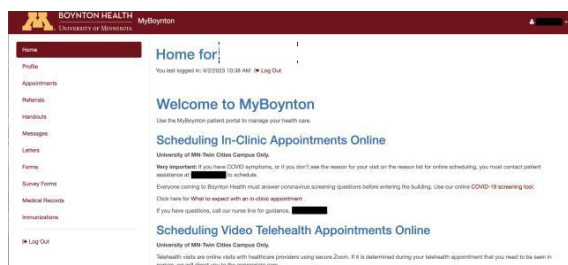


Fig.1 MyBoynton patient portal

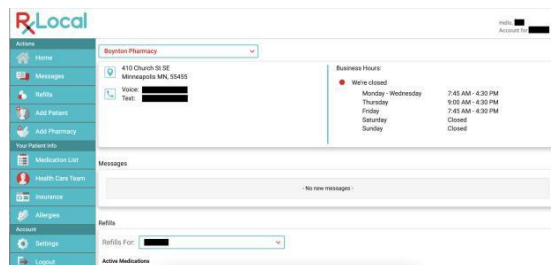


Fig.2 Rxlocal Patient Portal

## **Issues and Negative Consequences**

In previous studies, we could know that difficulty accessing the portal due to password, computer, or server problems was frequently identified as a barrier by both patients and providers. Problems typical of any website such as forgetting the user's password and server downtime were reported (Powell & Myers, 2018).

For the lack of integration between MyBoynton and Rxlocal refill systems, the absence of a built-in link in the patient portal to the refill website can create inconvenience for users, as they would have to download the app on their mobile phone or search the website separately. Additionally, even though patients' medical information is linked back to the MyBoynton patient portal, they must register a separate account and enter their personal information again for the Rxlocal Patient Portal. Moreover, the Rxlocal Patient Portal itself has some technical errors that can further hinder user experience.

These issues and negative consequences can cause several challenges, such as user frustration, medication non-adherence, data security risks, and increased workload on healthcare providers. Users may become frustrated with the extra steps required to access the refill function and the need to duplicate their personal information when registering for the Rxlocal Patient Portal, leading to a decrease in user engagement and discouraging them from using the refill function altogether. Moreover, if patients have difficulty accessing the refill function, they may be more likely to run out of medication or forget to order refills, leading to medication non-adherence and negative health outcomes. Requiring patients to register for a separate account and provide personal information for the Rxlocal Patient Portal may also increase the risk of data breaches, potentially compromising patient privacy and leading to negative consequences for both patients and healthcare providers. Lastly, the increased burden on healthcare

providers to assist patients in using the refill function may affect their ability to provide timely and efficient care to all patients.

### **Methods**

In the book *Field guide to human centered design book -- I.D.E.O.*, researcher emphasized the importance of embracing ambiguity, trusting the process, and maintaining a human-centered approach (I.D.E.O., 2016). This means starting from a place of not knowing the answer to the problem, being open to pursuing different ideas, and arriving at unexpected solutions through collaboration and feedback from the people being served. In this study, the approach could encourage the designer to be creative and innovative, and use the design process to arrive at solutions that are desirable, feasible, and viable. We can tell the importance of user-centered design and prioritize the needs and experiences of the people who will be using the product or service. So in this study, I will use the methods of heuristics and conversation starters and from I.D.E.O.

The Conversation Starters method is valuable for the challenge because it encourages creativity and outside-the-box thinking from the users (I.D.E.O., 2016). It helps to generate a variety of ideas and feedback that can be used to improve the patient portal's refill function. Here's the process to carry out this method: I operated this conversation method with two users other than myself of the MyBoynton patient portal after determining what I want the users to react to -- I want to see users' expectations towards the refill system under a patient portal website. So what type of page do they want to see? I presented different iterations of the prototype of refill pages to the users and ask for their opinions (Fig.3-5).

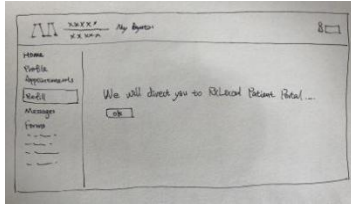


Fig.3 Option1: Built-in button direct to external RxLocal

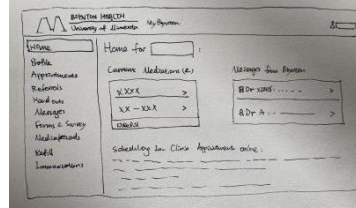


Fig.4 Option2: Show refill option on homepage

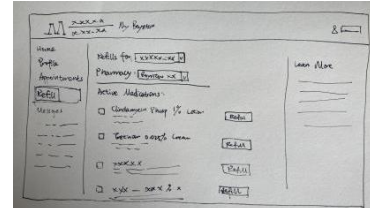


Fig.5 Option3: Show refill information in specific column

## Data Collection and Insights

In this study, I collected data on users' preferences and experiences with accessing the refill function on a patient portal website. Through the analysis of the data, I identified several key insights that can inform the design of a more user-friendly and streamlined refill process: First, users expressed a strong desire for simplicity and convenience in accessing the refill function. Specifically, they preferred a process that did not require them to navigate multiple platforms or websites or provide redundant personal information. Instead, users valued a one-stop-shop approach that allowed them to access all relevant functions in one place. Besides, users appreciated having a built-in link or button on the main patient portal website that led directly to the refill function, as it saved time and effort. They found having to download a separate app or search for the refill website themselves to be time-consuming and frustrating. Additionally, users emphasized the importance of data security and privacy when using the refill function. They wanted reassurance that their personal information was being protected and felt uneasy about registering a new account and filling in personal information again for the refill portal. Users are expected the refill function to be user-friendly and easy to navigate, with clear instructions and prompts for filling prescriptions. They appreciated having all the relevant functions in

one place for ease of use.

During the conversation, I kept myself open to how the users interpret the concepts and ask more questions to learn about their thoughts and needs. Here are some of the feedback from the users:

“I expect to find all the relevant functions in one place for ease of use. Having to download a separate app or search for the refill website myself is time consuming and can be frustrating. Also having to register a new account and fill in personal information again for the refill portal is unnecessary and feels redundant. It would be more efficient if my information could be automatically transferred from the main patient portal to the refill portal, or at least have the option to use my existing login credentials.”

“I think it would be ideal to have a built-in link or button on the main patient portal website that leads directly to the refill function. This would save users time and effort in searching for the refill website.”

For the three iterations of the prototype of refill pages, option 1 and 3 got more favors. The most reason that users prefer option 1: built-in button direct to external RxLocal is that it looks simple and follows the current system/ structure of both MyBoynton and RxLocal patient portal. However, one user mentioned it might be hard to find the refill function among all functions on the left sidebar/ list. For option 3: show refill information in a specific column, users like it because it is connected to the original website firmly and feels like more functions could be fit in for this additional column/ page. However, option 3 has the same issue as option 1: it could be hard to find the refill function among all on the left sidebar. Option 2: show refill option on the homepage is the least welcomed one because it changed the existing layout of the

patient portal and could be too complicated to show on the homepage. Functions are very hard to be distinguished if there is too much information shown on the homepage.

It is also noticeable that the findings and insights from the interview suggest that a streamlined and user-friendly refill process is essential for ensuring a positive user experience on a patient portal website. To achieve this, it may be helpful to incorporate a built-in link or button that leads directly to the refill function and to minimize the need for redundant personal information. Additionally, it is important to prioritize data security and privacy and to provide clear instructions and prompts for filling prescriptions.

### Reframe the design

After interviews with two users of the MyBoynton Patient Portal, I used post-it notes to sort out insights from the data I collected and reframed the design. The affinity diagram shows the collection of user feedback that is organized into groups/ themes based on their relationships (Fig. 6).



Fig.6 Affinity Diagram showing user's feedback in organized groups/ themes

Based on the data I collected from heuristics and conversation starters user interviews, I group these insights into themes by sorting out insight statements and

reframed the design: In an effort to improve the refill process for patients who use the MyBoynton patient portal, we are exploring the integration of the Rxlocal Patient Portal into the main website. The ultimate impact we hope to achieve is a reduction in the need for duplicate registration and personal information entry.

To accomplish this goal, we are supposed to first consider the challenges and constraints that we face. One significant constraint is the technological limitations of both the MyBoynton and Rxlocal Patient Portal systems. We need to work within the existing parameters to ensure that any changes or improvements are feasible and effective. Another critical factor to consider is the user population. We aim to make any changes or improvements as accessible and user-friendly as possible for the diverse range of end-users. This means that we must prioritize the user interface and functionality of the Rxlocal Patient Portal to reduce frustration and errors for patients. Eventually, we will focus our project on three design principles generated from our previous study: Convenience and ease of use; Seamlessness and integration; User-centered.

### **Design prototype and User Testing**

After brainstorming several possible solutions to the problem at hand and addressing existing pain points and issues for patients/users of the MyBoynton patient portal, I created a set of prototypes based on the previous iteration, trying to reduce the likelihood of errors and improve the overall user experience (Fig. 7-10). For the start page/ homepage, I put the refill information on it with scheduled appointments since these are the most common function in the patient portal (Fig. 7) as mentioned by users. I also added the Refill column on the left sidebar. For updates on a specific column, I set a dot on the top right of the text so that users could notice it without being too



distracted. Besides, users could click the “View More” button on the homepage and head to the Refills page with more detailed information.



Fig.7 Prototype page 1: Home page

For the Refills page, I put the user's and pharmacy's names on top to reduce the risk of taking someone else's medication by mistake (Fig. 8). Additionally, I added the list of currently active medications and integrate it with medication instructions and refills. By clicking the box on the right of the specific medication, user could ask for a refill.

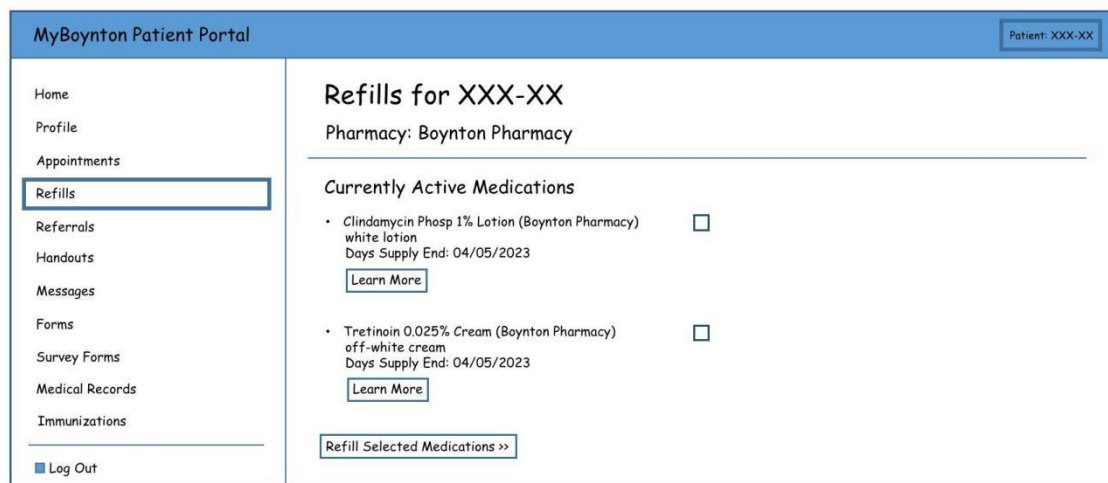


Fig.8 Prototype page 2: Refills page - Currently active medications

On same Refills page, by clicking “Learn More”, user could see the instruction for the

medication before refilling. (Fig. 9).

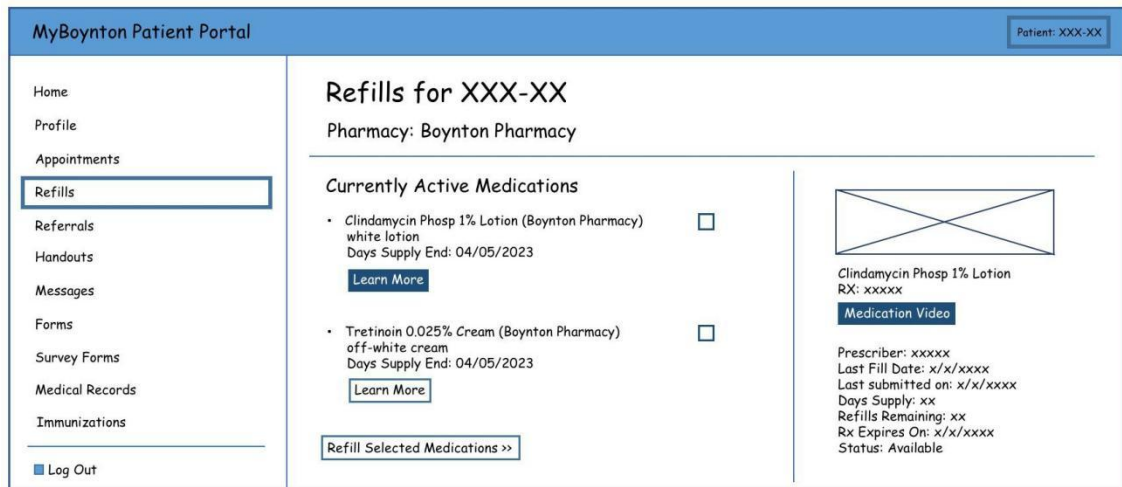


Fig.9 Prototype page 2: Refills page - Medication instructions

After clicking the checking box and selecting the medications, user will be directed to methods of delivery as the next step (Fig. 10).

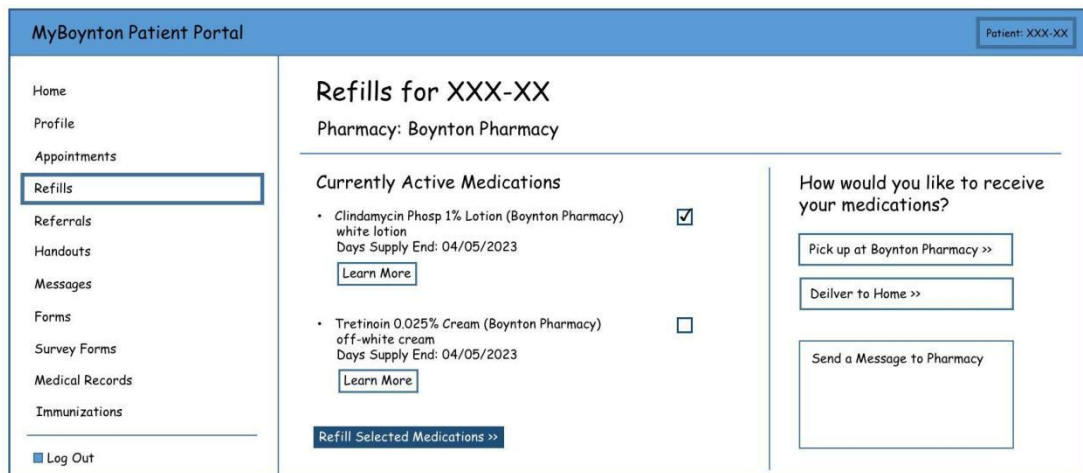


Fig.10 Prototype page 2: Refills page - Methods of delivery

In the user testing stage, I'm planning to invite 10 more users to perform medication refill request tasks in the refined prototype of the MyBoynton patient portal and to determine how well they could use the portal to perform these tasks.

For user testing, inclusion criteria will be: 18 to 65 years of age; ability to speak in

English; ability to use a computer and navigate through websites; and either having a medical condition or being a caregiver for a person with a medical condition.

Patients were recruited with multiple methods, including flyers in Boynton clinics, an online sign-up form on the existing patient portal, and a direct approach in waiting areas. Patients who met the inclusion criteria and were interested in participating will be introduced to the study. Informed consent will be obtained. At the end of the session, the patient will be given a gift card worth US \$20. The project is also needed to be approved by a professional Institutional Review Board.

Participants will be invited to log in to the portal using a fictitious account that was prepopulated with patient data. The participants will be first invited to explore the portal for its various functionalities and affordances, then invited to complete five tasks chosen to be representative medicine refill request tasks (Ancker et al., 2015):

1. Reviewing personal information from a previous medicine.
2. Reading up about a specific medical condition.
3. Request the refill for their current medication.
4. Check and confirm medications requested for refills and the location of the clinic or pharmacy to obtain them.
5. Enabling a family member's access to the account (proxy access).

Besides, screen activity will be recorded through an audio recording and screen-capture software (Morae, TechSmith, Inc., Okemos, Michigan, United States). An additional layer of rich qualitative data will be collected by inviting the participants to provide a continuous verbal accounting of their thoughts as they completed the tasks, a procedure known as the concurrent “verbal protocol” or

“think-aloud protocol” procedure (Ali et al., 2018). These protocols have been demonstrated to capture cognitive processes during problem-solving. In addition to performing each task, participants will be invited to comment on how well the technology allowed them to perform the task. Audio recordings were transcribed and analyzed.

### **Benefits and limitations of the design prototype**

Among all three HF outcomes: safety, performance, satisfaction, I would prioritize satisfaction in my prototype and design principles since patient satisfaction is an important factor in treatment, especially treatment adherence. If patients are satisfied with the device and find it easy to use, they are more likely to comply with treatment recommendations, leading to better health outcomes.

For the benefits and limitations of the prototype itself, in my recommended design, the MyBoynton patient portal was integrated with the Rxlocal refill system, which could provide several benefits. First, patients could access all the relevant functions in one place, without the need to navigate multiple platforms or websites or provide redundant personal information. This would save time and effort and increase user engagement. Second, a built-in link or button on the main patient portal website that led directly to the refill function would be more convenient for users, increasing their satisfaction with the portal. Third, data security and privacy concerns could be addressed by providing reassurance to patients that their personal information is being protected, as all information would be accessed through a single, secure platform. Last but not the least, this integration could reduce the workload on healthcare providers, who would no longer need to assist patients in using the refill function separately.

However, there are also limitations to this design. On the one hand, integrating two different systems can be complex and time-consuming, requiring significant technical expertise and resources. On the other hand, there may be compatibility issues between the two systems that could cause errors or glitches in the refill process, which could lead to user frustration and decreased engagement.

Additionally, though I tried to make all design patterns and elements consistent for the web pages, the integration may still require a couple of changes to the existing systems, which could require additional training and support for users and healthcare providers. Also, this design may not address all the issues identified in the previous user interview, such as integrating it with messages and making the font and background color adjustable.

### **Design recommendation**

From previous research we could also know that navigating between multiple screens was frequently identified as a usability barrier (Roman et al., 2017). Improve usability of the health IT with screens is important, based on this, here's my redesign recommendation from my prototype and future design:

To begin with, the interface should be designed to be simple and easy to navigate for the users. This can be achieved by avoiding cluttering the screen with too many buttons, options, or information that could confuse users. Instead, the focus should be on presenting the most essential information and options that the users need to perform their tasks efficiently. By simplifying the interface, users can quickly find what they need and complete their tasks with ease.

Besides, clear and concise language should be used in the interface/ screens to enhance user comprehension. The use of technical jargon or complex terms that the

users may not understand should be avoided. Instead, language that is familiar to the users and that they can relate to should be used.

Additionally, consistent design patterns and elements should be used throughout the system/ set of screens to enhance user familiarity and ease of use. For example, using the same color scheme, font, and button styles across all screens. Consistency could help users to quickly learn and understand the interface, adopting a common set of design patterns is one way to utilize consistency and recognition over recall to improve usability (Sloan & Horton, 2019).

Moreover, providing customization options to users can improve user satisfaction and make the system more usable. Users should be able to adjust the font size, color scheme, or the layout of the interface to suit their needs.

In conclusion, designing a user-friendly health IT with screens involves several factors that must be considered to enhance usability and user experience, even if it's just a Refill page as part of the system. Widespread use of health information technology (IT) could potentially increase patients' access to their health information and facilitate future goals of advancing patient-centered care (Baldwin et al., 2017), but it's also worth keeping in mind that a user-friendly health IT interface should be designed to be simple, clear, and consistent, while also being accessible and customizable to users.

## Reference

- Adoption and use of an online patient portal for diabetes (Diabetes-STAR). In AMIA annual symposium proceedings (Vol. 2006, p. 1080). American Medical Informatics Association.
- Ali, S. B., Romero, J., Morrison, K., Hafeez, B., & Ancker, J. S. (2018). Focus section health IT usability: applying a task-technology fit model to adapt an electronic patient portal for patient work. *Applied Clinical Informatics*, 9(01), 174-184.
- Ancker, J. S., Witteman, H. O., Hafeez, B., Provencher, T., Van de Graaf, M., & Wei, E. (2015). The invisible work of personal health information management among people with multiple chronic conditions: qualitative interview study among patients and providers. *Journal of medical Internet research*, 17(6), e137.
- Baldwin, J. L., Singh, H., Sittig, D. F., & Giardina, T. D. (2017, September). Patient portals and health apps: Pitfalls, promises, and what one might learn from the other. In *Healthcare* (Vol. 5, No. 3, pp. 81-85). Elsevier.
- Design Kit, I. D. E. O. (2016). *The field guide to human centered design*.
- Kuziemsky, C. E., Randell, R., & Borycki, E. M. (2016). Understanding unintended consequences and health information technology. *Yearbook of Medical Informatics*, 25(01), 53-60.
- MyBoynton patient portal. MyBoynton Patient Portal|Boynton Health. (n.d.). Retrieved from <https://boynton.umn.edu/myboynton>
- Osborn, C. Y., Mayberry, L. S., Wallston, K. A., Johnson, K. B., & Elasy, T. A. (2013). Understanding patient portal use: implications for medication management. *Journal of medical Internet research*, 15(7), e2589.

- Powell, K., & Myers, C. (2018). Electronic patient portals: patient and provider perceptions. *Online Journal of Nursing Informatics*, 22(1).
- Roman, L. C., Ancker, J. S., Johnson, S. B., & Senathirajah, Y. (2017). Navigation in the electronic health record: a review of the safety and usability literature. *Journal of biomedical informatics*, 67, 69-79.
- Ross, S. E., Haverhals, L. M., Main, D. S., Bull, S. S., Pratte, K., & Lin, C. T. (2006).
- Sloan, D., & Horton, S. (2019). Usability, universal usability, and design patterns. *Web Accessibility: A Foundation for Research*, 445-460.
- Turvey, C. L., Zulman, D. M., Nazi, K. M., Wakefield, B. J., Woods, S. S., Hogan, T. P., ... & McInnes, K. (2012). Transfer of information from personal health records: A survey of veterans using My Health e Vet. *Telemedicine and e-Health*, 18(2), 109-114.