Engaging Patients with their Care:

Using Social Media and Text Messaging to Create Virtual, Cost-Effective Support

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Abstract
This report was primarily prepared for Hopkins Home Care (HHC) Nurses, Clinicians, and Professor Bob Graham by students in the Master of Science in Engineering Management program at Johns Hopkins University. Nurses Lisa Ryan and Sarah McGann initially identified potential for reduction of patient readmission for Urinary Tract Infections (UTIs). However, after using marketing strategies to perform an analysis, we discovered that the underlying problem is a lack of patient engagement in care. We were able to narrow our scope to provide a feasible, two-part solution that will increase patients' connections to their own care: the use of social media to create a virtual support group for patients and caregivers, and the use of text-messaging for daily reminders of healthy behaviors.

Overview of Current Situation
Initially Presented Information
When we were first presented with the goals of our joint project with HHC, the goals of the project seemed very clinical. The problem we were first presented with was that patients continued to be readmitted to HHC with Urinary Tract Infections (UTIs), despite the fact that there are very simple prevention techniques. Patients can mitigate UTI risk by drinking water frequently, practicing proper techniques when using the restroom or exchanging a catheter, and using the restroom whenever the need arises. However, the rate of readmission is 30-40 patients a month, or 5% of the monthly patient pool - and UTIs, according to HHC nurses, play a large part in those readmissions.[1]

A Narrowed Focus: Moving from the Clinical to the Human
What really caught our attention was what Lisa and Sarah stated as the main reason behind those readmissions: that patients weren't maintaining healthy behaviors, knowingly or otherwise. This changed our scope away from UTI readmission; we instead focused on why people wouldn't maintain healthy behaviors. We saw **three issues** at the heart of the readmission problem:

- **There isn't an incentive for patients to maintain healthy behaviors**. If an isolated patient maintains unhealthy behaviors but no illness occurs, patients won't understand the risk.
- **After the first week, patients don't feel connected with their care.** It isn't feasible for nurses to be able to meet with patients all the time. However, patients don't currently feel connected enough with care to prioritize this over daily, short-term comfort.
- **Solutions to human problems are expensive to implement**. As Lisa and Sarah said on the first day of class, "everything boils down to money eventually." HHC doesn't have a lot of funding to spend on solutions to the readmission issue.

We thought the creation of a social media-based support and reminder system, based specifically in Facebook and Text Messaging, would address these three issues. First, a Facebook Group or Page could be used to provide avenues for patient-patient interaction that is completely optional, but could provide solidarity. Secondly, in order to keep patients connected with the goals of Home Care, high-risk patients and their caregivers could opt into receiving daily text messages to continue a sense of nurse-patient interaction. Finally, above all, a social media solution would be extremely cost-effective and wouldn't require an above-and-beyond request like, say, hiring more nurses.

Use of Social Media Support Groups as a Health Intervention for Seniors
Considering that a significant portion of the HHC patient population is in the age range of 60-80 years, the usage of Facebook and Text Messaging sounds like a millennial solution to a baby boomer problem. However, statistics from the Pew Research Center indicate that seniors (defined as 65+) actually spend a significant time connected to the internet - 84% of seniors are on social media, and more than half of seniors report having a high-speed broadband connection at home. Of those people, more than 80% report going online at least once every 3-5 days, and 8 million seniors spend more than 20 hours online per week. This indicates that, despite popular belief, older generations are pretty connected.[2]

Facebook: An Optional Avenue for Inter-Patient Motivation

Is Patient-Patient Interaction Effective in Motivating Healthy Behaviors?

The Center for Disease Control has stated that "the use of social media tools is a powerful channel to reach target audiences with health interventions."[3] In addition, Inter-patient interaction via support groups has been found to be effective for treating patients with chronic and mental illness. Support Groups were found to increase the lives of patients with chronic illness by two years, and were found to be superior to one-one-one counseling or medication alone in patients with mental illness. [4]

Implementation of a Facebook Page vs Facebook Group

We first recommended that HHC should implement a support-group style group on Facebook. Facebook's group platform allows for interactive polls and encouraging posts. It would also provide a way to standardize UTI education through its file-sharing service. However, spoke about how a private Facebook group may cause issues with risk management. Thus, while we still believe that having a support group will allow patients to feel like part of a network, which will motivate a healthier lifestyle, we recognize that a private group may be a more long-term solution. (We have still provided implementation details in Appendix 1). As a currently implementable solution, we suggest that HHC establish a Facebook presence through implementing a Facebook Page. This will be the first step toward providing a platform for patient-patient interaction.

Effective Facebook Use: Johns Hopkins Medicine vs the North Shore Hospital Network

While Johns Hopkins Medicine is generally risk averse, it actually has its own Facebook page, which posts fairly regularly. Because of this, HHC could establish its own Facebook Page without legal issues. However, instead of posting hard-to-read articles like the JHMI Facebook page currently does, we recommend following the example of the North Shore University Health System in Chicago, Illinois.

The North Shore Health System (NSHS) is currently nominated for a Shorty Award for best Healthcare Social Media Campaign for its use of Facebook as a Health Intervention. NSHS' approach to Facebook has been pretty unique; instead of posting content from its website, it has created specific content for it Facebook page. For example, in the last month, NSHS posted infographics with general health tips, a call for advice for the hospital that received over 1000 engagements, and a video of a cookie recipe. The overall reach of NSHS' Facebook campaign has provided 1.6 million impressions, and in just the past year, it had 291% follower growth. Most importantly, though, NSHS reports increased customer satisfaction since implementation of the Facebook page. Taking a Facebook-specific approach has been successful for NSHN, and we believe it could be successful for HHC as well.[6]

Expected Outcomes

Considering that HHC interacts with thousands of people, between patients, caregivers, and nurses, we think that HHC's Facebook page would be able to reach 500 likes within the first year. We would recommend measuring engagements with posts over that year to understand the demographic of the page's audience and to understand its growth. A long-term goal would be to reach the viral reach of NSHN's Facebook page, which currently has just under 100,000 likes and followers. Providing this platform will not only set the stage for potentially using Facebook's group functionality in the future, but will help HHC establish a way for patients to interact with each other on their own.

Text Messaging: Keeping Higher-Risk Patients Personally Connected with their Care

The Efficacy of Text Messaging as a Health Intervention

UTIs are easily prevented with proper care, and health emergencies can be prevented by early diagnosis. Many patients don't remember these UTI prevention techniques. Thus, the issue of readmittance could

be addressed by reminding patients of care through recurring text message reminders. Text messaging will be useful for these reminders because 99% of text messages are opened, and 90% of them are opened within 3 minutes of receipt. Furthermore, a study was conducted in 2014 in which an automated text messaging system was used to remind acute coronary syndrome patients, whose average age was 57.9 years, to take medication. 93.5% of these patients found these reminders helpful in forming healthier habits, and no patients found it unhelpful.[7]

Examples of Reminder Text Messages

Examples of reminders we could send to patients in these messages include:

Low Risk Patients and Caregivers

- "Remember to drink water today!"
- Reminders of healthy urine colors – or to at least check urine color
- Reminders of proper wiping techniques

Patients who use Catheters

- Reminders of proper "changing" hygiene
- Reminders of catheter-changing days
- Reminders to keep bags clean and off the ground

Text message reminders will engage patients who take care of themselves, but can also be sent to caregivers in order to actively engage them in patients' healthcare as well.

Use of an Automated System to Send Reminder Texts

There are a number of automated text messaging services available that require little to no effort to set up that would also allow for patient responses; these include TXT180, Mosio, and Zingle. However, we recommend TXT180 due to its ease of use and cost. Costs associated with all text messaging services are dependent on the number of messages and potential recipients. We recommend small-scale implementation of this system for high-risk patients by sending 10,000 messages for $150/month.

Some of the functionalities that TXT180 provides include:

- Flexibility to opt in or out of text messages at any point.
- Categorization of contacts into different groups. This would, for example, allow nurses to group patients with catheters, low-risk patients, and caregivers into separate groups to easily send different information to each party.
- Ability to schedule messages on a daily, weekly or a monthly basis.
- Ability to monitor patient responses.

Expected Outcomes:

Because the messaging systems we mentioned allow for monitoring of patient responses, we think that asking for responses every so often will be useful to HHC. Noting the number of responses over a period of time, similar to monitoring Facebook impressions, would allow for a concrete statistic of patient and caregiver engagement. We think a reasonable short-term goal would be a 25% response rate, while a long-term goal would be 50%.

Conclusion

We believe that engaging patients in their care is the first step to the long-term goal of reducing readmissions to HHC due to UTIs. Our recommendations for patient-engagement is twofold:

- First, creating a Facebook Page will allow HHC to provide a platform for patient interaction that wouldn't cause the problems of a private Facebook group.
- Secondly, implementing a recurring text message system will allow patients to stay connected with the goals of HHC.

These low-cost solutions will help HHC build a stronger connection with their patients, which in turn, will hopefully help the patients help themselves to reduce their risk of contracting UTIs.

Works Cited

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3. "CDC Social Media Tools, Guidelines & Best Practices." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 22 Jan. 2014. Web. Mar. 2017. <https://www.cdc.gov/socialmedia/tools/guidelines/socialmediatoolkit.html>.

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6. "NorthShore Connects with Patients Through Social Content - The Shorty Awards." *Shorty Awards*. N.p., n.d. Web. 11 Mar. 2017. <http://shortyawards.com/6th/northshore-connects-with-patients-through-social-content>.

7. Sahar Khansari, et al. *Effect of a reminder system using an automated short messaging service on medication adherence following acute coronary syndrome.* Eur J Cardiovascular Nursing. Published 02, February 2014.

Appendices:

Appendix 1: Implementation of a Facebook **Group** as a Health Intervention

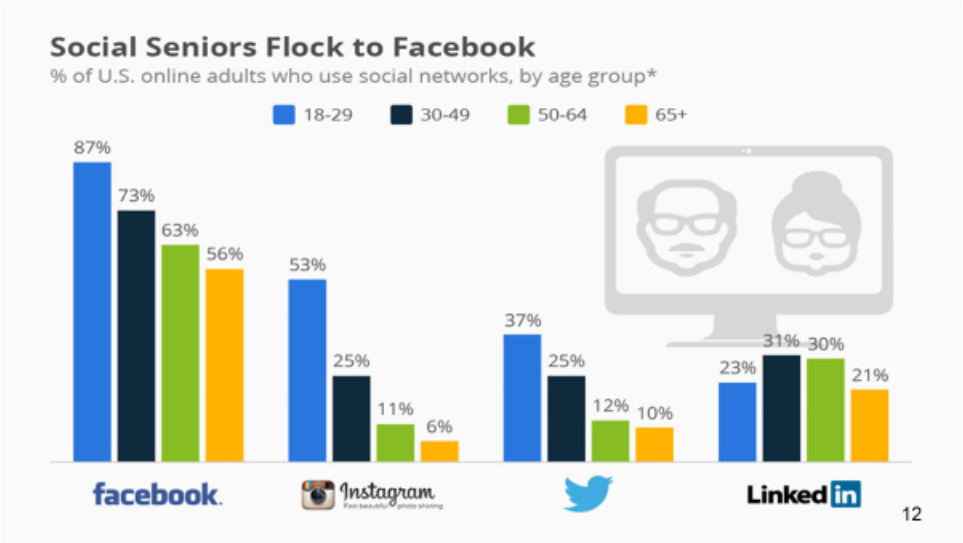

Figure 1:

This is a chart of social media usage broken down by website that was created from 2014 data. From this figure, it is clear that Facebook is the most popular social media website; this is why we chose it for our social media solution.

Figure 2:

Posters such as the above one can be posted on the Facebook groups. The above poster emphasizes on how a person can increase their water intake. This is a useful poster for patients who are susceptible to UTIs as they will be encouraged to drink more water, thus engaging the patients in their own healthcare.

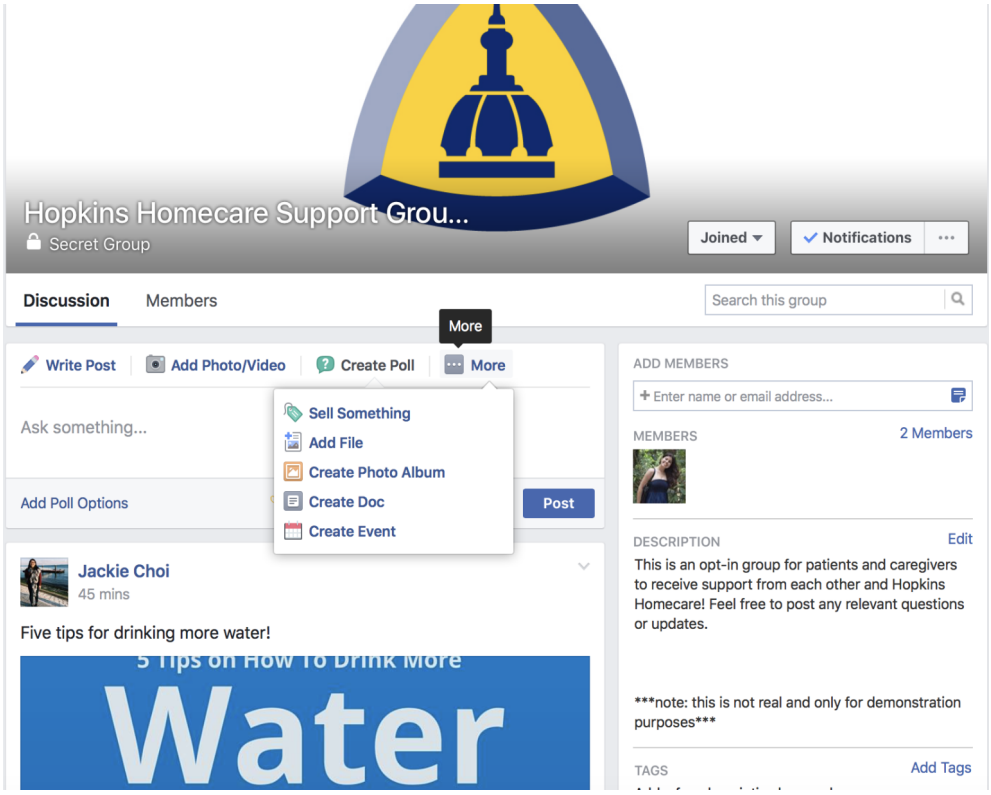

Figure 3:
Facebook groups have different features such as Pictures, Files, Polls and Comments.

Figure 4:
For example, the functions of files in Facebook can be a useful tool in creating supporting groups. Nurses and care takers can upload docs to this group which can standardize UTI education by posting relevant files.

Figure 5:

We can also start polls on the Facebook supporting groups such as asking them how many glasses of water they drink today. The patients can vote for the number of drinks they got this day, in this way the nurses can have a thorough idea of how good they do in daily life.

Appendix 2: Implementation Details of Text Messaging as a Health Intervention

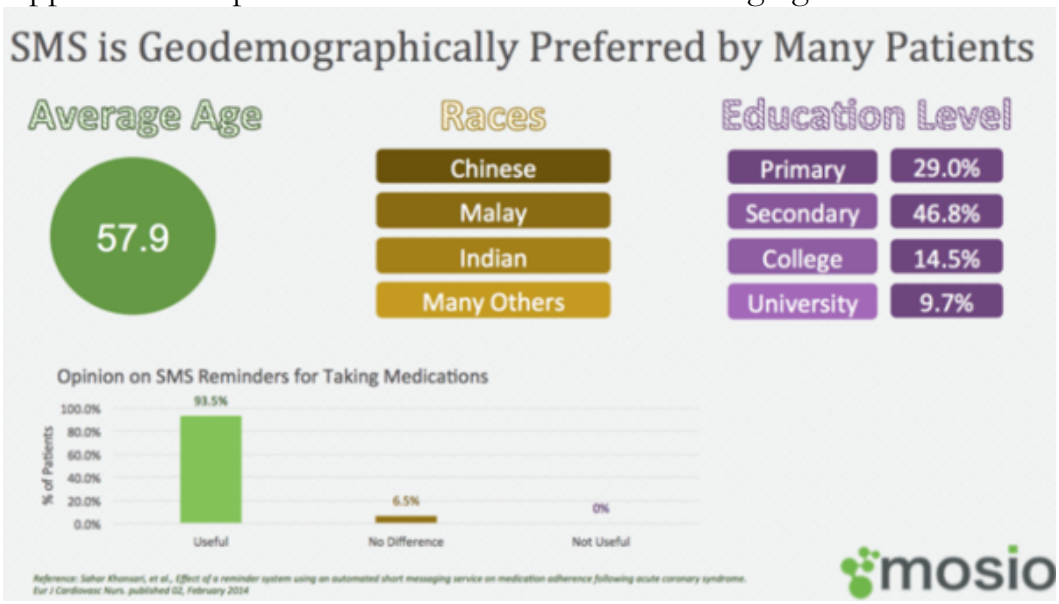

Figure 6:

Short message services are preferred by many patients. The average age of patients using text messages is 57.9 years old, and the races are a good diversity. In addition, the education level varies a lot, and through primary school level to university, each level have balanced users of text messages. It obvious that text messages have a wide range of users and customers, which can be very useful in sending warnings or reminders to UTIs with it.

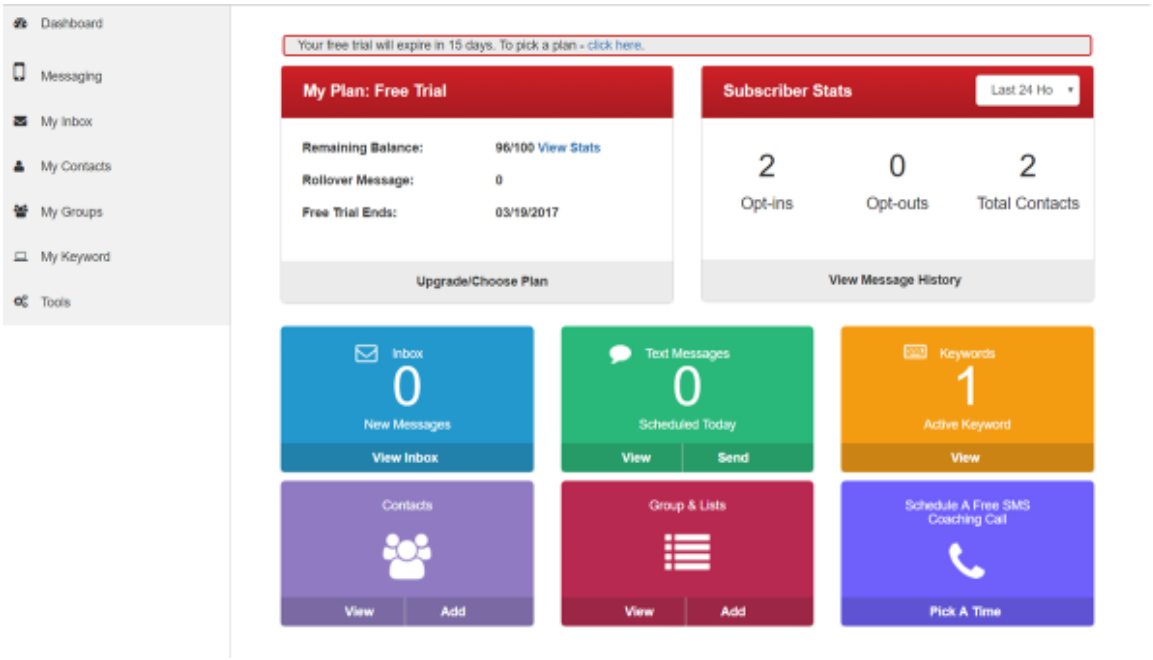

Figure 7:
This is the page of an application. TXT 180 which is the cheapest option that we found. It is easy to use this app to text everyone in your contact. Also, this doesn't cost much, just connect to the internet and send messages to patients.

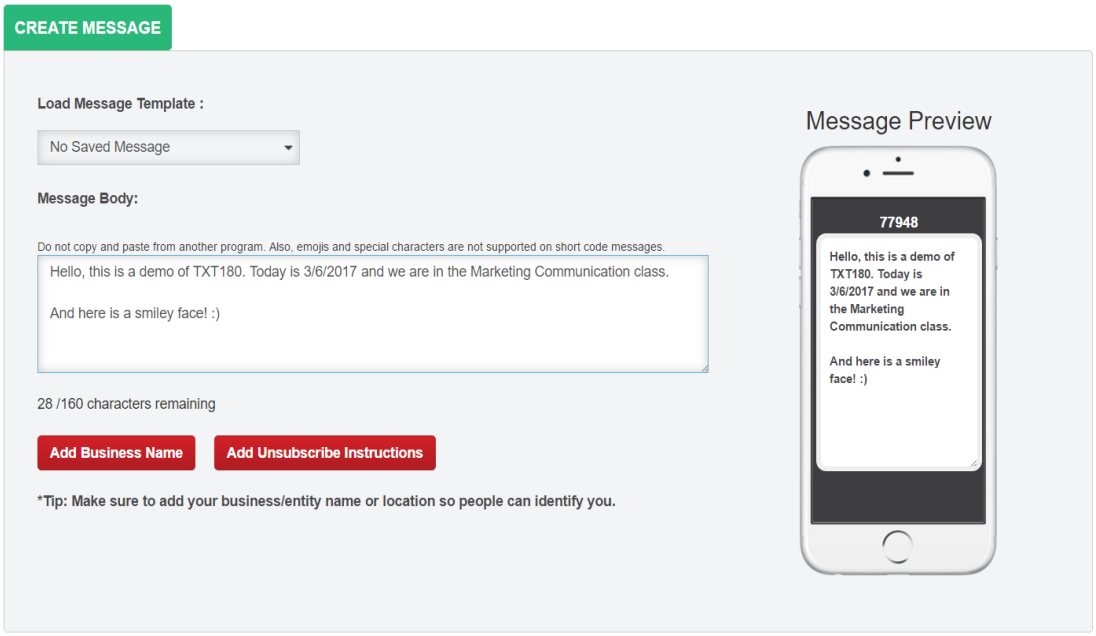

Figure 8:
This serves as automate text messages. We can edit the messages through this app, set the template and the message body, after editing it we can add subscribe instructions and other options to our message. The content can be various for different level patients. For Low Risk Patients and Caregivers, we can

write “Remember to drink water today!” For Patients who use Catheters, we can send reminders of proper “changing” hygiene.

Figure 9:

What is more convenient to use this automated text strategy, nurses can also select different date or time to send the messages. They can set the whole month’s sending messages date and time just in 5 min.

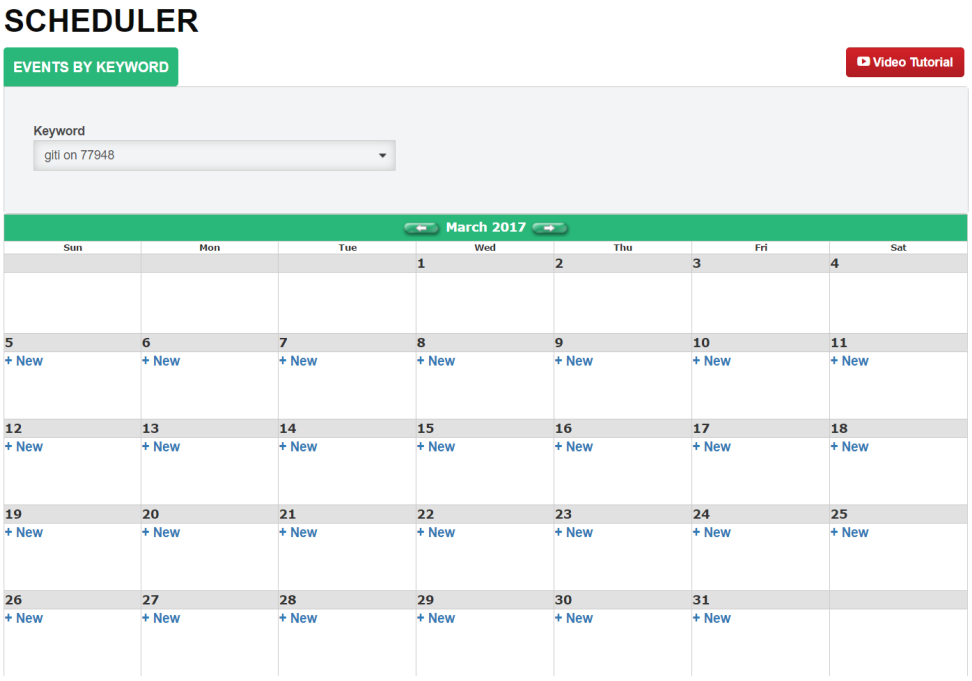

Figure 10:

On a daily basis the messages are sending out to patients, with flexibility and convenience. The nurses can also check which date do they send out messages to patients.

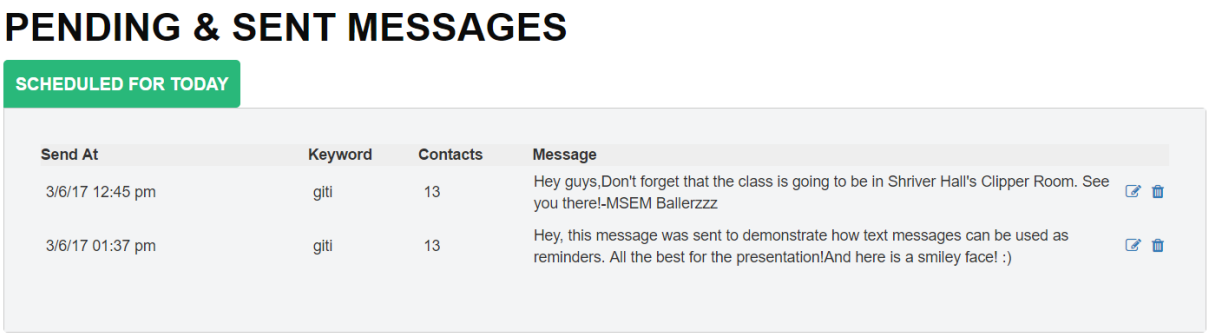

Figure 10:

It can also send messages to a group of people and save the history of messages so the nurses can check them. What's more, it has the ability to monitor patient responses. This could be useful if nurses were to need to monitor for symptoms of UTIs or follow-ups.

These strategies can improve patient engagement, encourage them to drink more water and prevent their health conditions getting worse.