Developing and Implementing a Radiation Oncology App to Improve the Patient Experience

WellSpan Health is an integrated health system that serves the communities of central Pennsylvania and northern Maryland. The organization is comprised of eight hospitals, more than 19,000 employees, and more than 170 patient care locations. WellSpan is a charitable, mission-driven organization, committed to exceptional care for all, lifelong wellness, and healthy communities. WellSpan has experienced rapid growth in recent years and currently provides care at six community-based cancer centers in South Central Pennsylvania.

In 2018 the Oncology Service Line recognized the potential to improve the patient experience with the development and implementation of a mobile radiation oncology application (app). This app supports the healthcare organization's goal to deliver a patient experience that is simpler, builds loyalty, and reduces patient anxiety.

An Idea is Born

The inspiration for a mobile app started during a 2018 system-wide re-evaluation of patient education materials at each of the six radiation oncology centers. The service line and radiation oncologists quickly realized that radiation therapy materials and resources varied significantly between clinic locations. In the

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process of implementing standardized patient education, the idea of providing consistent and targeted educational resources to patients in the form of a mobile app was proposed to WellSpan IT developers. This plan to improve and standardize patient education received early support from all clinic locations and the treating physicians.

At the time, several WellSpan service lines were exploring apps and other digital technology options, with some identifying commercially available applications that met their needs. However, given the unique needs of radiation oncology patients and the complex nature of radiation therapy treatments, Cancer Service Line leadership decided the best option was to develop an in-house app that would enable greater customization, as well as the ability to update information and patient education as needed.

Technology and Features

Radiation Oncology collaborated with IT to design and create the app, leveraging several technologies. For example, Native iOS and Android applications were developed using Swift and Kotlin, respectively. To support the mobile app, a custom Representational State Transfer (REST) Application Programming Interface (API) was developed using Microsoft's ASP.NET Core platform. This API connects to WellSpan's Epic Instance using Epic's web services. Epic web services are used to provide authentication based on a patient's MyChart credentials and to retrieve upcoming appointments.

Patient treatment appointments are easily accessible in the app. The app interfaces with Epic, so the schedules are taken directly from WellSpan's electronic health record. Changes made in the electronic health record scheduling system automatically appear in the app. To date, this feature is the one most utilized by patients. Having the ability to see schedule changes and upcoming appointment times helps reduce patient anxiety and improves coordination of care with other specialties during treatment.

Patient education is a central feature of the app. A multidisciplinary team of physicians, nurses, and radiation therapists helped to develop standardized, comprehensive, disease-site specific patient education on various radiation therapy treatment modalities and their side effects. With online educational material available on the radiation oncology app, patients and families benefited from on-demand access to treatment- and disease-specific education. (This information is not meant to replace the traditional education given to patients during treatment appointments—rather, the mobile app supplements face-to-face education and written education and is easily accessible in between appointments or when questions arise.) Providing multiple sources and platforms of information gives our patients options on how they self-educate and greater control of the role they play in their care. With a system-wide approach and standardized education, we are also more likely to direct patients toward quality and up-to-date information. Finally, patients and family members can go back and review information in the app at their own pace and when questions arise, reducing the need for patients and family members to turn to the Internet for non-vetted information.

In addition to standardization of patient education materials, Press Ganey data identified an opportunity to improve education about the management of radiation oncology treatment-related side effects. To meet this need, WellSpan partnered with ASTRO to embed its digital education platform, "RT Answers," which directs patients to relevant education based on disease site and symptoms, into the app. The app also provides vetted education videos and disease-specific "frequently asked questions" that patients can discuss with physicians and other providers before, during, and after treatment.

The app allows patients to monitor and report symptoms to their care team. Figure 1, right, illustrates the steps in patient symptom reporting. The app lets the patient select a specific symptom and rate it on a severity scale. The goal is to have patients play a more active role in their treatment and side effect management. By increasing patient awareness of common symptoms—and tracking them in the app—more effective management of symptoms and the necessary interventions are more likely to occur during treatment visits. Figure 2, right, shows sample data for a patient's average symptom ratings over time.

One of the most important aspects of cancer care is patient-provider communication. The app allows patients to play a more active role in communicating with their care team, as well as improved and increased communication—additional touchpoints—between treatment teams and patients. Building relationships with our patients and getting to know them is a fundamental WellSpan principle; gaining the trust of our patients is key, and the app allows our patients to learn more about their care teams through short biographies that providers can tailor as they see

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ACCC 36th National Oncology Conference. (L to R) ACCC Executive Director Christian G. Downs, JD, MHA; ACCC Past-President Ali McBride, PharmD, MS, BCOP; Bryan Schmalhofer, MBA, RT(R)(T); and ACCC President Randall A. Oyer, MD.

Figure 1. Patient Symptom Reporting

Figure 2. Sample Data of Average Symptom Ratings Reported over Time
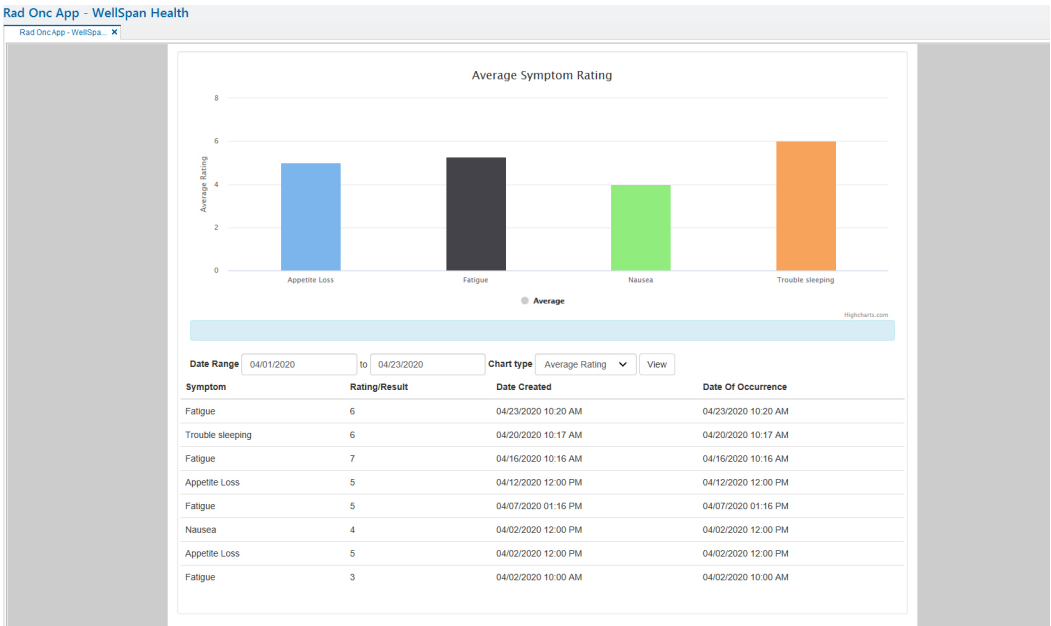
fit. This access to the care team adds a personal touch to the care we provide and creates connections outside of the disease and treatment.

Finally, the app also includes information on available support services. All WellSpan support groups and services specific to the patients' geographical location and/or the cancer center where they receive treatment is easily accessible on the app, including links to phone numbers and websites.

Next Steps

WellSpan has several initiatives in progress to improve the digital services we offer our patients. For example, we are currently in the process of transitioning from a standalone mobile app. The shift will include the app's functionality in MyWellSpan, WellSpan Health's implementation of Epic's MyChart platform. This platform offers patients personalized and secure access to portions of their medical records and enables secure management of information on any device—mobile, tablet, or PC. Key considerations for transitioning from a standalone mobile app to MyWellSpan are:

- An integrated online patient experience.
- Easier communication using secure messaging.
- Proxy access for family and caregivers.
- Improved awareness and access to other WellSpan services and benefits.
- Support of multiple devices.

Figure 3. Treatment Plan and Treatment Progress Indicator
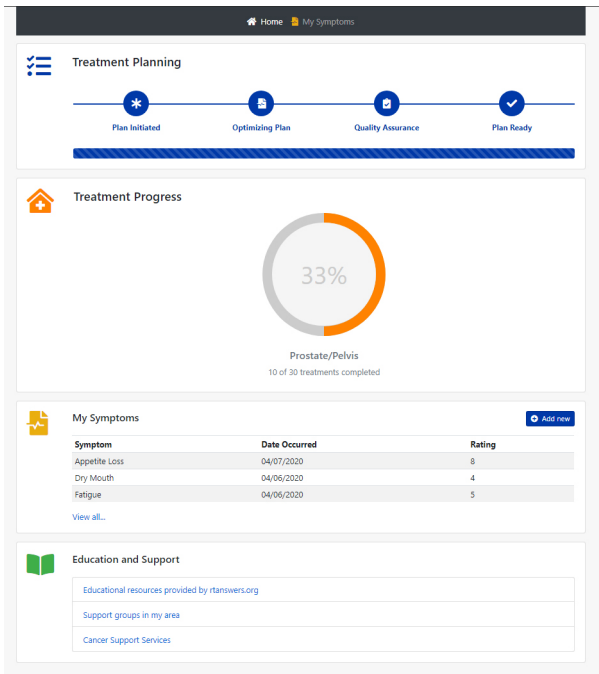
Bringing the mobile app, and the work already completed, onto this system-wide platform allows us to leverage other online WellSpan initiatives, while providing a more seamless patient experience, because most of our patients are already using MyWellSpan prior to a cancer diagnosis. With the great work already happening throughout the organization to increase MyWellSpan usage, oncology service line leadership anticipates a synergistic effect, streamlining and removing barriers to patient adoption.

Another exciting development is the future integration of our Dosimetry Dashboard. Dosimetry Dashboard is a custom web app used to coordinate the treatment planning workflow. The data captured by the Dosimetry Dashboard will allow patients to monitor the progress and status of their treatment plan during this phase of care. Providing this additional information aims to reduce the anxiety experienced by many patients as they await the start of treatment. Lastly, we are evaluating the development of a treatment progress indicator that would display the remaining fractions in the current course of treatment. Figure 3, left, shows a prototype of the redesigned app as a responsive website. Giving patients visual progress indicators seeks to empower them with information and, for some, provide light at the end of the tunnel.

Final Thoughts

A great deal of innovation and progress has happened since setting an initial goal of standardizing patient educational material. WellSpan has learned many lessons implementing its mobile app and made some thoughtful pivots along the way. With any digital strategy it is important to have a roll-out plan in place early in the process. Key considerations when implementing a new technology should include plans to enroll patients and educate staff. Gaining buy-in from all stakeholders is critical to success.

Our patients expect and deserve convenience, which can have different meanings to different people. We must remain nimble and continue to adapt to the unique needs of our patients with cancer. This objective requires our organization to continually evaluate and improve its technology. Throughout all of the changes and new developments, one constant remains: WellSpan's unwavering commitment to improving the care and experience we provide our cancer patients. Developing and implementing a mobile app has taught us to always keep the patients and their needs at the forefront of any new digital initiative. If we do so, we will successfully navigate any twists and turns along the way and continue to head in the right direction. OI