Telehealth platforms continue to grow and offer innovative health access options for patients outside the traditional clinic and hospital settings. These platforms have proven to be beneficial to hematology/oncology patients because they facilitate expanded access to care and monitoring.\textsuperscript{1,2} Patient benefits of this improved monitoring include decreased hospitalizations and dehydration events, as well as improved fitness levels and performance status.\textsuperscript{3-6}

Oncology is increasingly recognizing the importance of patient-reported outcomes (PROs), which have shown significant associations with key health outcomes, such as performance status and treatment adherence. Digital telehealth platforms have the potential to facilitate PROs data capture and may afford additional benefits, such as real-time and remote monitoring with automated interventional triggers.

Patients receiving oncologic care are predisposed to disease- and treatment-related issues, many of which have shown to be preventable through proactive monitoring and management. In 2019, Ochsner Health’s Department of Hematology/Oncology developed a digital chemotherapy remote monitoring program called Chemotherapy Care Companion. Preliminary program results showed a decrease in emergency department (ED) visits and hospitalizations through the tracking of patients’ vitals and questionnaire responses. Earlier recognition and intervention also improved quality of life indicators and patient satisfaction for those enrolled in the program.

What is Digital Remote Monitoring?
Digital remote monitoring is a merger of software and hardware technologies within healthcare delivery and management. Electronic devices are used to collect health data from individuals in one location and electronically transmit that information to healthcare providers in a different location for assessment and recommendations.

Since 2021, interest in remote patient monitoring has rapidly expanded, as shown by the increase of venture capitalist investments in this technology.\textsuperscript{7}

Rationale and Configuration
For patients with cancer, the most common diagnoses for ED visits are related to infection and sepsis, dehydration, pain, and hypertension. Cancer-related ED visits account for 3.7 percent of all patients seen in the ED in 2021; approximately, 27 percent of patients with solid tumors had at least one ED visit while on treatment.\textsuperscript{8-10}

In 2019, Ochsner Health developed its Chemotherapy Care Companion program to monitor and manage patients’ therapy complications. The program was designed to help providers identify issues earlier and mitigate any symptoms that could lead to ED visits and/or hospital admissions. It works by monitoring patients’ vital signs and escalating any variations from

Patients receiving oncologic care are predisposed to disease- and treatment-related issues, many of which have shown to be preventable through proactive monitoring and management.
baseline vitals data and normal range data to providers. These data, including escalations, are shared via patients’ personal devices through the Chemotherapy Care Companion platform, which was designed and integrated within the electronic health record (Epic). Ochsner Health initially piloted its Chemotherapy Care Companion at the Gayle and Tom Benson Cancer Center. The program has since expanded to two additional regional cancer centers and several community oncology care clinics within the Ochsner Health system.

Ochsner Health employs 33 hematology/oncology physicians and 17 oncology advanced practice providers (APPs) across the system, encompassing 3 regional cancer centers and 6 additional clinic and infusion sites. In 2022, Ochsner Health provided care to more than 35,000 unique patients with cancer.

Nuts and Bolts
Chemotherapy Care Companion went live in January 2020 and is used to monitor Ochsner Health oncology patients in the outpatient setting by tracking vital signs and questionnaire responses to help identify issues caused or exacerbated by systemic therapy. All patients initiating or already undergoing systemic anti-cancer therapies (chemotherapy, immunotherapy, or oral tyrosine kinase inhibitors [TKI]) are eligible to participate. The monitoring kit includes a digital blood pressure cuff, digital scale, and digital thermometer. (The original kit included a pulse oximeter, which was removed during the COVID-19 pandemic, as these tools needed to be prioritized for COVID-19-related virtual monitoring programs.)

(continued on page 27)
Ochsner Health introduced its retail “O Bars” at its hospitals and clinics, allowing patients to access innovative, interactive health technology. O Bars are staffed full time by technology specialists and have now been placed in all of its cancer centers to support its digital programs.

Figure 3. e-Consent in Patient Portal

Figure 4. Enrollment in Patient Portal
Table 1. Daily Tasks for Completion in Patient Portal App

<table>
<thead>
<tr>
<th>TASK</th>
<th>DUE TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily questionnaire</td>
<td>9:00 AM</td>
</tr>
<tr>
<td>Daily weight entry</td>
<td>9:00 AM</td>
</tr>
<tr>
<td>Daily temperature entry</td>
<td>9:00 AM</td>
</tr>
<tr>
<td>Morning blood pressure &amp; heart rate reading</td>
<td>9:00 AM</td>
</tr>
<tr>
<td>Evening blood pressure &amp; heart rate reading</td>
<td>3:00 PM</td>
</tr>
</tbody>
</table>

(continued from page 25)

Enrollment Process
For all patients with orders to initiate any chemotherapy, immunotherapy, or TKIs, a best practice advisory automatically appears within Epic to remind physicians to enroll the patient in Chemotherapy Care Companion (Figure 1, page 25). Opening the best practice advisory activates a smart set in Epic that allows for automatic enrollment and completion of the consent process (Figure 2, page 25). The patient then receives an e-consent (Figure 3, page 26) through their MyOchsner portal, including a welcome letter and barcode, and visits the Ochsner O Bar to receive and set up the devices needed to participate (Figure 4, page 26). Ochsner Health introduced its retail “O Bars” at its hospitals and clinics, allowing patients to access innovative, interactive health technology. Ochsner Health’s O Bars are staffed full time by technology specialists and have now been placed in all of its cancer centers to support its digital programs.

Once enrolled and consented to Chemotherapy Care Companion, patients are assigned a series of daily tasks, including a symptom survey, weight entry, temperature entry, AM/PM blood pressure, and AM/PM heart rate reading (Table 1, left), and the system can send automatic push notification reminders to patients for PROs (patient reported outcomes) completion in the patient portal app. Vital signs are then uploaded automatically from the integrated Bluetooth devices to the patient portal and into Epic for provider review. Figure 5, below, provides examples of patients’ responses.

Patient escalations can be triggered by questionnaire responses (Figure 6, page 28) or vital sign changes and are sent to a monitoring pool via Epic in-basket messages (Figure 7, page 28) that are monitored from 7:00 AM to 5:00 PM by APPs. Figures 8 and 9, page 29, show flowsheet reports of a patient’s vital signs. If variations in vitals from baseline are detected or concerns are raised on questionnaire responses, patients are then contacted by APPs to be triaged and offered care recommendations. All data are permanently stored in the patient’s records. If an intervention is required because of triggered escalations by a patient’s results, APPs respond and document their responses and treatment recommendations via an Epic smart phrase (Figures 10a and 10b, page 29).

The length of enrollment in this program varies by patient and regimen, but Chemotherapy Care Companion generally concludes when the clinician documents an end-of-treatment date under the patient’s treatment plan (Figure 11, page 30). Patients can also opt out of Chemotherapy Care Companion at any time.

Figure 5. Examples of Patient Responses
In 2018, prior to the development of Chemotherapy Care Companion, Ochsner Health's Department of Hematology/Oncology embedded an urgent care clinic within the cancer center. The goal of this specialized clinic is to improve the quality of cancer care by increasing patient access to specialized providers and reducing the burden of ED visits. This clinic proved to be a major support to the success of Chemotherapy Care Companion because it facilitates same- or next-day patient access to the clinic when alerts trigger a need for the patient to be seen by a provider. All APPs at the urgent care clinic have two one-hour slots that are blocked daily on their schedule to accommodate any patients needing to be triaged, including those who need to be seen within 24 hours for assessment and intervention, either in person or on the virtual platform. Patients also have access to the infusion room for intravenous fluids, pain management, antiemetics, and antibiotics.

(continued on page 30)
Epic Information Technology

Ochsner Health’s Epic information technology (IT) team was invaluable in providing program support and design enhancements throughout the development of Chemotherapy Care Companion. As mentioned above, in the two years since the program went live, Ochsner Health expanded the use of Chemotherapy Care Companion from the Gayle and Tom Benson Cancer Center to all regional cancer centers and most oncology clinic and infusion sites through local O Bar sites within the Ochsner Health system. Each site provides onboarding support, device distribution locations, and patient navigation workflows. Each site also developed their own, local APP monitoring pools and provided training and education to all providers and clinical staff.

Moreso, Chemotherapy Care Companion has expanded beyond just patients being treated by medical oncology to include those in the bone marrow transplant program, patients with acute inpatient leukemia who are on discharge, and those being seen by palliative care, gynecologic oncology, and the cardio-oncology program.

Ochsner Health created a monthly enhancement committee with its IT/Epic partners to discuss and design program updates and create an operational alliance across all Ochsner Health sites. The many successes of this committee included the development of an interactive patient storyboard as a response to patient feedback, allowing for reminders so patients enter data, and the ability for patients to engage with providers more actively while in the program.

Preliminary Results and Outcomes

To date, Chemotherapy Care Companion has been funded entirely through philanthropy dollars, with all patients receiving free monitoring devices when participating in the program. The future goal is to advocate for insurance coverage for this program based on successful results.

As of October 31, 2022, Ochsner Health enrolled more than 500 patients in Chemotherapy Care Companion. Patients ranged in age from 23 years to 86 years and represented all cancer stages, with 50 percent being Stage 4 diagnoses (Figures 12, right, and 13, page 31).

Ochsner Health began tracking interventions in August 2021, and more than 130 patient interventions occurred in 2022. Chemotherapy Care Companion had a 70 percent compliance rate, which is defined as successful completion of at least 50 percent of daily tasks by patients. Preliminary data show a 33 percent reduction in ED visits, from 4.9 ED visits for non-enrolled patients to 3.3 ED visits for patients enrolled in Chemotherapy Care Companion.

Patient Satisfaction

In August 2022, all actively enrolled Chemotherapy Care Companion patients received a nine-question survey. Ochsner Health received 131 responses, with the following results:
Figure 13. Participation in Chemotherapy Care Companion by Curative vs. Palliative Intent

- 90 percent of patients are “very satisfied” or “satisfied” with Chemotherapy Care Companion overall
- More than 90 percent of patients would recommend Chemotherapy Care Companion to a friend or colleague
- Nearly 90 percent of patients are “very satisfied” or “satisfied” in their understanding of why they were enrolled in Chemotherapy Care Companion
- 90 percent of patients think Chemotherapy Care Companion’s instructions are clear and easy to understand
- 70 percent of patients are “very satisfied” and 20 percent are “satisfied” with the O Bar help
- 85 percent of patients are “very satisfied” or “satisfied” with the ease of the daily questionnaires and submission of vitals
- More than 80 percent of patients state that Chemotherapy Care Companion gives them a sense of security and well-being when knowing they are actively being monitored
- 85 percent of patients are “very satisfied” or “satisfied” with booking an appointment when they need to be seen.

Looking Ahead

Ochsner Health is now looking to incorporate additional devices, including wearable options, to allow for additional patient support and data metrics. The success of Chemotherapy Care Companion has furthered Ochsner Health’s commitment to offering home monitoring to all patients on active treatment regimens, and Ochsner Health has been fortunate to have philanthropic support to meet these needs. Moving forward, it is hoped that data results will support insurance coverage of these devices based on cost savings through earlier interventions. Ochsner Health also plans to continue to develop unique patient-specific educational resources and questionnaires based on individual diagnoses and treatment plans. With grant support, Ochsner Health is initiating a pilot to support patients with sickle cell anemia through the digital monitoring platform, improving support to another vulnerable patient population.

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References


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