

# Improving Outcomes through Digital Medicine





**T**elehealth 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.<sup>1,2</sup> Patient benefits of this improved monitoring include decreased hospitalizations and dehydration events, as well as improved fitness levels and performance status.<sup>3-6</sup>

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

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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.<sup>7</sup>

### 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.<sup>8-10</sup>

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

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)

Figure 1. Best Practice Advisory in EHR

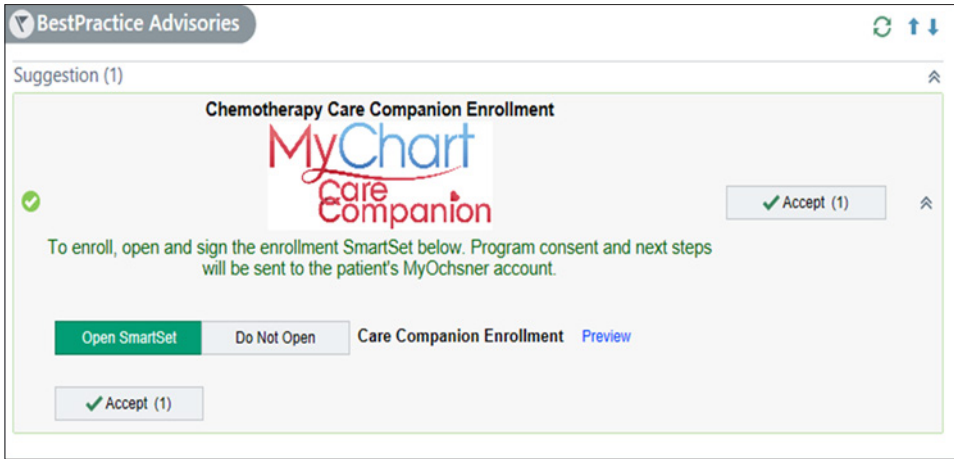
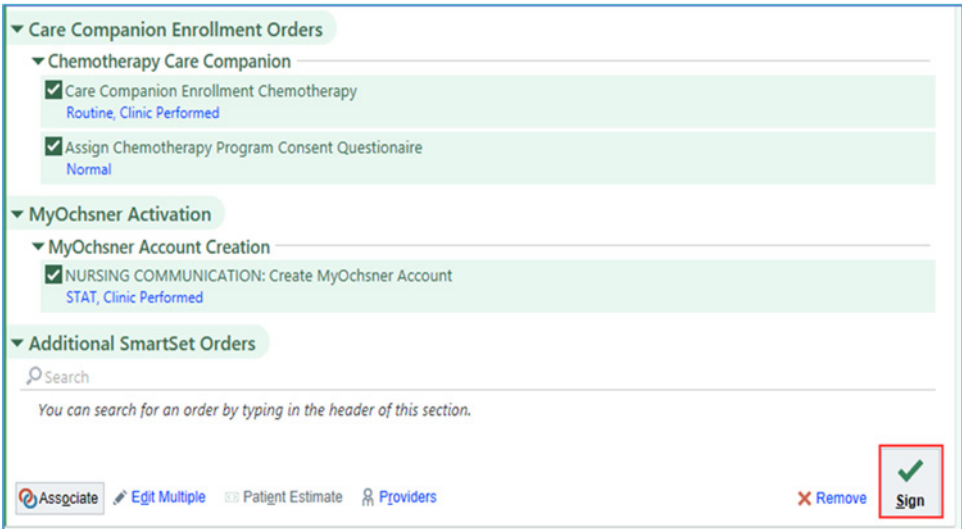


Figure 2. Enrollment Order





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

Questionnaires

Chemotherapy Care Companion Consent

Please read and click **Yes** if you agree with the statement below:

About the Program

The goal of the Ochsner Chemotherapy Care Companion Program is to help you more conveniently manage your health through a virtual, at home, monitoring of your vitals. We are very excited you have decided to participate and look forward to helping you. Before starting, we need to share with you some more details and what is required of you.

Enrollment Requirements

- An active MyOchsner account.
- Your own iPhone or Android-based smartphone.

Participation Requirements

- Take at least two heart rate and blood pressure readings per day, additional daily vital sign readings, and answering a questionnaire. In the beginning, your clinical team may ask for additional readings to better understand your patterns.
- Failure to comply with the participation requirements may result in removal from the program. This will not affect your relationship with your provider or Ochsner Health System.

Informed Consent

- Your Care Team will regularly review your home readings along with other portions of your medical record.
- To contact your care team, use the "Communicate with Your Provider" feature in MyOchsner. As always, you can reach your physician at his/her office.
- Your care team will not be monitoring your readings in real time, so in case of emergency, you must contact your physician or go to the nearest emergency room.
- You may either decline participation in or withdraw from the program at any time without affecting your relationship with your physician.
- All services will be provided in a setting that insures patient privacy and confidentiality.

By clicking "Yes" below you attest that you understand and agree with the above.

Yes

No

Figure 4. Enrollment in Patient Portal

Ochsner Health System

Care Companion Enrollment Chemotherapy [MYC31]

Date: 9/3/2019

Nursing

Ordering Department: None Hematology

Ordering/Authorizing: Oncology

Chemosex Tester

25 y o Male

9/3/1994

Mobile

PCP: None

MyChart: Active

Welcome Tester,

You have been chosen to participate into the Ochsner Care Companion Program. Please look to the consent form sent to your MyOchsner account.

Sincerely,

Ochsner O Bar Information:

You qualify for a device to participate into the program. Please head over to the O Bar located in the Ochsner Center for Primary Care and Wellness with this letter to complete the enrollment process

O Bar Location:

1401 Jefferson Highway

New Orleans, LA 70121

Discount Code: OB-MYC3CHEMOCARE

Expires: 9/17/2019

This program involves the use of the iHealth Kit

Kit Includes:

BP device

Ear Thermometer

Digital Scale

→ Patient receives info on where to retrieve devices at no cost with the provided coupon code.

**Table 1. Daily Tasks for Completion in Patient Portal App**

TASK	DUE TIME
Daily questionnaire	9:00 AM
Daily weight entry	9:00 AM
Daily temperature entry	9:00 AM
Morning blood pressure & heartrate reading	9:00 AM
Evening blog pressure & heartrate reading	3:00 PM

(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**

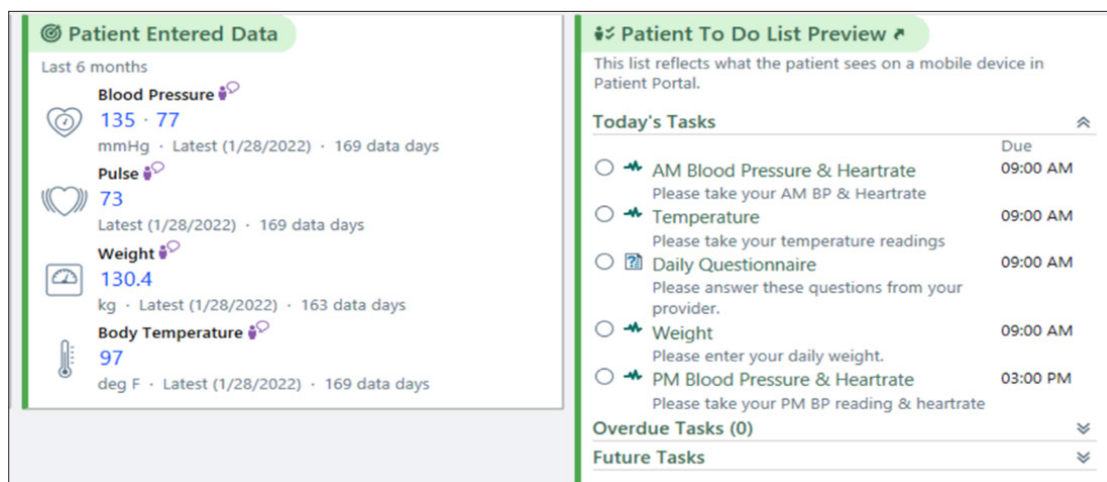




Figure 6. Chemotherapy Questionnaire

Ohs Myc3 Chemo Therapy Questionnaire			
Question	1/10/2022 12:53 PM CST - Filed by Patient	1/9/2022 10:10 AM CST - Filed by Patient	1/8/2022 11:03 AM CST - Filed by Patient
Are you having difficult eating or drinking that needs assistance?	No	No	No
Are you having uncontrolled nausea or vomiting?	No	No	No
Are you experiencing uncontrolled pain?	No	No	No
Do you feel dizzy or light headed?	No	No	No
Have you had any fevers, chills, or concerns for an infection?	No	No	No
Are you having any uncontrolled diarrhea or constipation?	No	No	Yes
How many bowel movements in the last 24 hours? (range: 0 - 100)	1	2	3
Are you experiencing uncontrolled itching or new rashes?	No	No	No
Have you missed any doses of your medication?	No	No	No
Additional Documentation			
Flowsheets: Patient-Reported Data			

Figure 7. EHR In-Basket Message

In Basket			
New Msg Patient Msg Refresh Edit Pools Manage Pools Personalize Search Manage QuickActions			
My Messages			
My Open Charts (1)			
My Open Encounters (115)			
Appointment Notification (4)			
Pt Questionnaires			
BestPractice (18)			
Care Companion Alerts (20)			
Care Companion Alerts 20 unread, 231 total			
Status	3 Subject	4 Msg Date	
Read ? Pool?: X	No Patient Readings Entered	09/10/2019	
Read ? Pool?: X	No Patient Readings Entered	09/10/2019	
Read ? Pool?: X	Patient Entered BP Incomplete	09/10/2019	
Read ? Pool?: X	Patient QNR Not Answered	09/10/2019	
Read ? Pool?: X	Alert: Patient Data Escalation - High Temper...	09/10/2019	
Read ? Pool?: X	Alert: Patient Entered Pulse Abnormal	09/10/2019	
Read ? Pool?: X	Warning: Patient Entered Pulse Abnormal	09/10/2019	

Additional System Support: Urgent Care

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)

Figure 8. Flowsheet Report of Vital Signs

Flowsheet Report

Select Flowsheets to View

OHS MYC3 CHEMO PATIENT ENTERED FLOWSH

Load More

	Units	1/11/2022	1/11/2022	1/11/2022	1/10/2022	1/10/2022	1/10/2022	1/9/2022	1/9/2022	1/9/2022	1/8/2022	1/8/2022	1/8/2022	1/8/2022	1/7/2022
Time		9:06 AM	9:05 AM	8:50 AM	12:52 PM	12:51 PM	8:42 AM	3:35 PM	10:06 AM	10:05 AM	11:01 AM	11:01 AM	10:18 AM	10:11 AM	3:11 AM
Systolic Blood Pressure			165			136				111		155			13
Diastolic Blood Pressure			95			85				65		84			70
Pulse			60			69				79		72			65
Body Temperature		97.7			98.1				98.1		97.9				
Weight	lb			285.2			285.8	283.2					285.2	284.8	

Figure 9. Flowsheet Report of Vital Signs 2

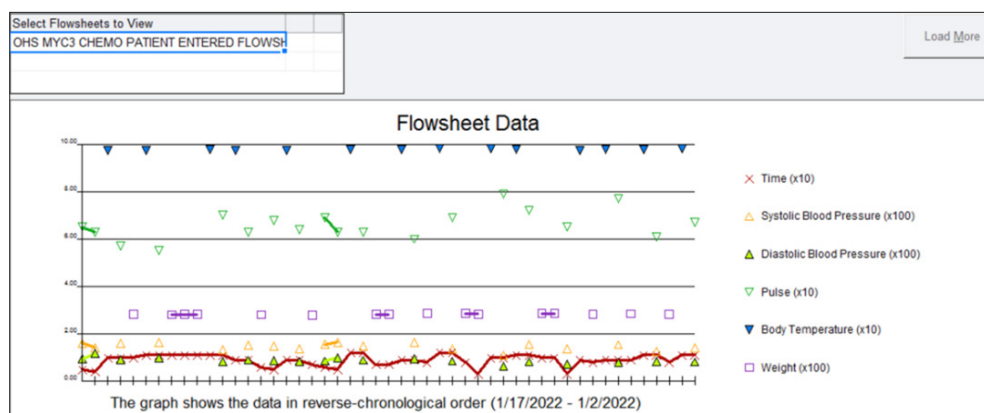


Figure 10a. Epic Smart Phrase Documentation

**Care Companion Intervention**

Reason for intervention: {ONC Care Companion Interventions Reason for Intervention:41199}  
Comment: {ONC Care Companion Intervention Comment:41201}  
Intervention: {ONC Care Companion Intervention:41200}  
Comment: {ONC Care Companion Intervention Comment:41202}

Hypertension  
Hypotension  
Other blood pressure issue  
Bradycardia  
Tachycardia  
Other pulse issue  
Weight increase  
Weight decrease  
Other weight change  
Questionnaire response  
Other reason (comment)

10b. Epic Smart Phrase Documentation

**Care Companion Intervention**

Reason for intervention: {ONC Care Companion Interventions Reason for Intervention:41199}  
Comment: {ONC Care Companion Intervention Comment:41201}  
Intervention: {ONC Care Companion Intervention:41200}  
Comment: {ONC Care Companion Intervention Comment:41202}

Medication change  
IV fluids  
Education provided to patient  
Patient instructed to go to urgent care  
Patient instructed to go to emergency department  
Referral to nutrition  
Referral to behavioral health  
Referral to physical therapy

(continued from page 28)

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).

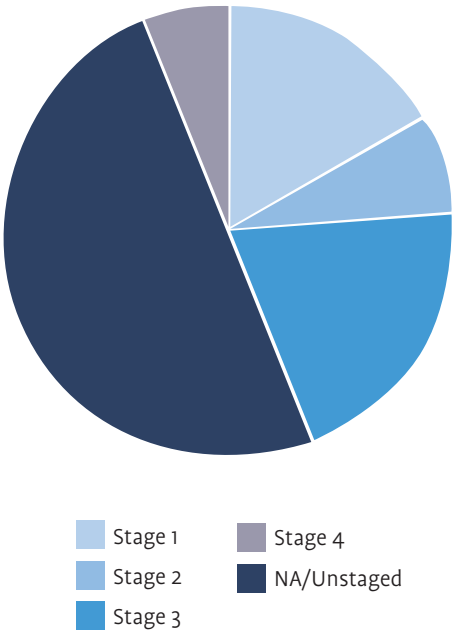
Ochsner Health began tracking interventions in August 2021, and more than 130 patient interventions occurred in 2022. Chemotherapy Care Companion had a 70 percent compliance rate, which is defined as successful completion of at least 50 percent of daily tasks by patients. Preliminary data show a 33 percent 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:

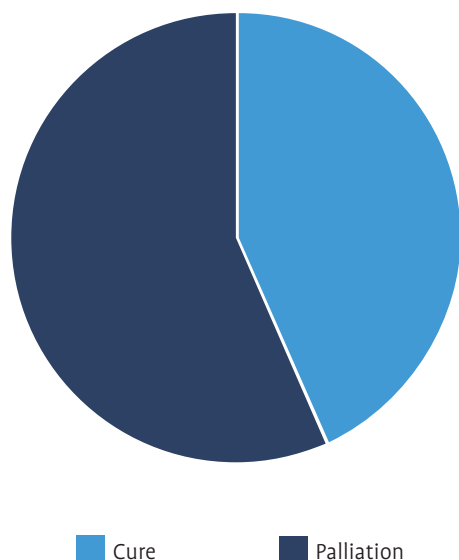
Figure 11. End of Treatment Summary

Figure 12. Participation in Chemotherapy Care Companion by Disease Stage






**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. 

*Zoe L. Larned, MD, is system chair, Hematology Oncology, and Erin Pierce, MSN, APRN, FNP-C, is manager of the Precision Cancer Therapeutics Program, Ochsner Health System in Louisiana.*

### References

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