

# » A Web-Based Patient Tracker

helps one cancer program transition to a multidisciplinary, primary care nursing model



Locating oncology patients along the care continuum at any given time and providing individualized attention can be a challenge for large cancer programs.

Critical steps in patient flow include:

- Greeting patients on arrival
- Registration completion
- Blood draw completion
- Rooming for exam
- Rooming for treatment.

In the summer of 2012 the Ruttenberg Cancer Center, New York, N.Y., developed and implemented a web-based patient tracking system to improve patient flow and enhance the patient experience. When the cancer program moved to its new location in the fall of 2012, this tool was integral in transitioning patient care to a multidisciplinary, modified primary nursing delivery model. (For more on this move and Ruttenberg Cancer Center's multidisciplinary care delivery model, see page 38.)

### Mapping Our Current & Future Processes

While the concept for the tool was based on an existing patient tracker, Ruttenberg Cancer Center's patient tracker was the result of a collaborative effort between our web-based development team, operations, and nursing. Step one was mapping the current processes at the cancer center. Only then could our process improvement team begin to design the new work flow, identifying critical points in the patient flow process and strategies for minimizing delays. Next, the team mapped out the future state of patient flow (Figure 1, pages 32-33) and piloted the patient tracker prior to the cancer center's move to a new location and care delivery model.

The initial design focused on the critical steps in the process where the patient tracker would facilitate and coordinate patient visits. Using six sigma and lean methods, our process improvement team established turnaround times as the baseline metrics for evaluating the effectiveness and success of the tool.

### Our Patient Tracker

The web-based tracker supports patient flow from arrival at the cancer center (greet time) to discharge (check out time).

**Greeting & Registration.** When they arrive, patients are greeted by front desk staff who then designate patients in the tracker as "greeted," which automatically generates an arrival time.

If a patient is not registered within 15 minutes of the greet time, the patient appointment changes to yellow on the tracker to alert staff that the patient has been waiting 15 minutes. If the patient is not registered in 30 minutes, the patient tracker appointment changes to pink. Staff quickly investigates these delays to resolve any issues and to ensure that patient wait times are not excessive. Future plans include a self-arrival kiosk where patients will be able check themselves in, as well as confirm demographic and insurance information; new patients will be able to complete forms. These enhancements to our patient tracker will further expedite the arrival and registration process.

Each morning the management team huddles to review the schedule and make any necessary staffing adjustments. In addition, the patient tracker alerts managers of potential delays by generating emails when patients have waited 15 minutes. Managers can then evaluate the reasons for the delay and make immediate adjustments to resolve these issues.

The patient tracker helps manage the registration process and reduce delays by generating a daily work list for registration staff. Once patients are greeted, they show up on a work list at each registration station computer. Registration staff then uses the work list to prioritize patient registration, comparing arrival times and scheduled visit times to identify the next patient for registration. This web-based work list eliminates the need for paper lists at the registration desk.

**Blood Draw Completion.** At the next critical step in the patient flow process—blood draw completion—phlebotomists use the tracker to designate when the blood draw is complete, alerting practice staff that the patient lab work was drawn and sent to

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The patient tracker helps manage the registration process and reduce delays by generating a daily work list. Once patients are greeted, they show up on a work list at each registration station computer. Staff then uses the work list to prioritize patient registration, comparing arrival times and scheduled visit times to identify the next patient for registration.

**Figure 1. Patient Work Flow**

**FRONT DESK  
STAFF “GREETER”**

**REGISTRATION**

**BLOOD DRAW  
AND VITAL SIGNS**

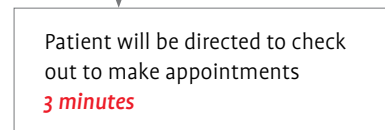
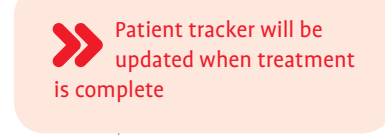
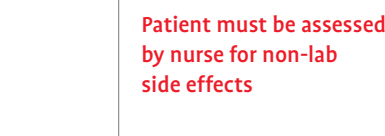
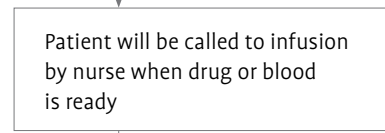
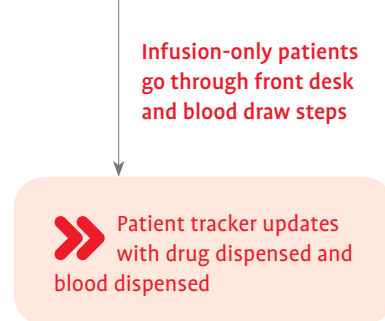
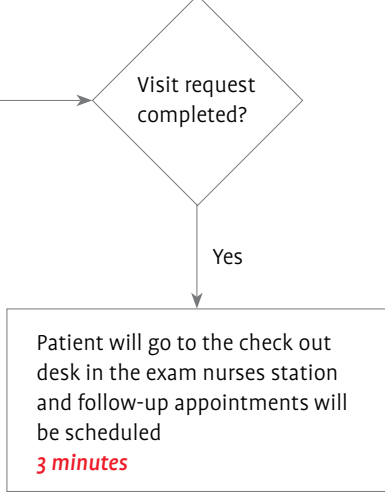
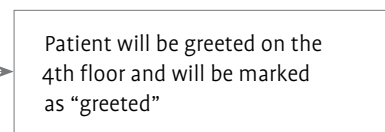
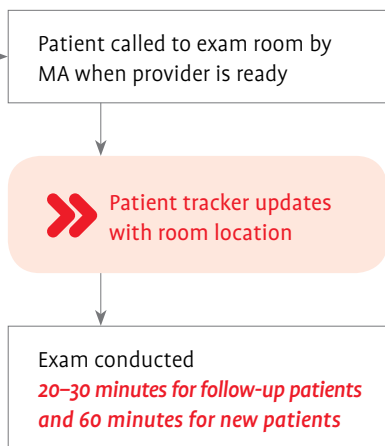




**EXAM**

**CHECK OUT**

**INFUSION**



**Figure 2. Screenshot of Patient Tracker**



**Figure 3. An Example of Patient Tracker Data Collected**

VISIT DATE	DATE/TIME OF CONFIRMATION	DATE/TIME OF GREETING	DATE/TIME CHECKED IN	DATE/TIME CHECKED OUT	CHECK IN LESS GREETING
Sept. 3	Aug. 8, 11:23 am	Sept. 3, 7:28 am	Sept. 3, 7:32 am	Sept. 3, 3:51 pm	00:04
Sept. 3	Aug. 4, 5:24 pm	Sept. 3, 9:31 am	Sept. 3, 9:39 am	Sept. 3, 6:41 pm	00:08
Sept. 5	Sept. 4, 12:21 pm	Sept. 5, 9:34 am	Sept. 5, 9:50 am	Sept. 5, 12:03 pm	00:16
Sept. 5	July 9, 5:16 pm	Sept. 5, 11:13 am	Sept. 5, 11:17 am	Sept. 5, 12:04 pm	00:04
Sept. 5	Sept. 4, 4:31 pm	Sept. 5, 11:22 am	Sept. 5, 11:31 am	Sept. 5, 12:04 pm	00:09
Sept. 8	Sept. 3, 10:18 am	Sept. 8, 8:29 am	Sept. 8, 8:43 am	Sept. 8, 5:43 pm	00:14
Sept. 8	Sept. 5, 2:50 pm	Sept. 8, 9:31 am	Sept. 8, 9:43 am	Sept. 8, 5:43 pm	00:12
Sept. 17	Sept. 5, 3:45 pm	Sept. 17, 8:27 am	Sept. 17, 8:40 am	Sept. 17, 5:37 pm	00:13
Sept. 18	Sept. 18, 10:24 am	Sept. 18, 10:18 am	Sept. 18, 10:27 am	Sept. 18, 12:17 pm	00:09
Sept. 19	Sept. 19, 10:18 am	Sept. 19, 10:21 am	Sept. 19, 10:26 am	Sept. 19, 5:22 pm	00:05
Sept. 23	Sept. 23, 9:23 am	Sept. 23, 9:49 am	Sept. 23, 10:13 am	Sept. 23, 1:59 pm	00:24
Sept. 25	Aug. 28, 2:42 pm	Sept. 25, 8:34 am	Sept. 25, 8:42 am	Sept. 25, 6:16 pm	00:08
Sept. 30	Sept. 12, 10:23 am	Sept. 30, 10:33 am	Sept. 30, 10:49 am	Sept. 30, 1:42 pm	00:16
<b>AVERAGE CHECK IN LESS GREETING TIME</b>					<b>00:11</b>

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the onsite lab. A new function is being added to the patient tracker to improve communication about manual differentials (counts done by the laboratory staff to confirm lab results). Specifically, we are establishing a process where the lab will use the tracker to identify when the blood has been drawn and to prioritize manual differentials. When the manual differential is complete, the lab technician will enter into the tracker that the test is complete and the slides are ready. This improved communication between the lab and the practice will reduce the number of phone calls and interruptions to the lab and identify delays so that managers can intervene as needed.

**Pharmacy.** Pharmacy staff uses the patient tracker to notify primary nurses when drugs have been dispensed, eliminating the need for nurses to call the pharmacy and allowing management to track time to dispense. Management can pull data from the patient tracker, including time stamps for the critical handoffs, into an Excel spreadsheet. Management then reviews this data to identify ways to improve the patient flow process and turnaround times.

All staff has access to the patient tracker on computers located throughout the cancer center. Figure 2, left, is a screenshot of the patient tracker and the information that is available to staff. With this real-time information staff can easily locate patients.

### **Our Assignment Grids**

Another feature of the patient tracker: assignment grids that identify unassigned patients on the left and nurses' names on the right so that physicians and pharmacy staff can easily locate their patients and their nurse. (Unassigned patients are patients that have been added to the schedule on the day of treatment.) The nursing coordinator works with nursing leads and nursing staff to assign patients to available chairs and to balance the workload. We only pre-assign patients for treatment; exam patients are assigned on arrival.

These web-based assignment grids replaced our existing paper assignment sheets. To support the new multidisciplinary care model, balance the workload of staff, and facilitate patient flow, we implemented two assignment grids. One grid assigns patients to exam rooms. The tracker allows staff to drag patient names from a patient list and drop them into an exam room. When patients are roomed, an automatic notification is sent to staff that patients are ready for assessment. This feature helps staff keep patients informed about delays and wait times.

The treatment assignment grid allows primary nurses to self-assign patients by reviewing the primary nurse assignments for the five most recent visits. If the primary nurse is not available on that day, associate nurses are assigned. The nursing coordinator is responsible for reviewing the nursing self-assignment grid and completing the assignment for a nurse who is not in on that day but who will be in the following day. To ensure optimal workload distribution, the primary nurses assign an acuity score to each of their patients; the nursing coordinator balances the nursing workload and tracks assignments for continuity of care. This pre-selection process not only balances

the workload of staff, it allows primary nurses to plan for their assignment and start the process of preparing for the treatment before patients arrive.

The treatment assignment grid lets nursing management monitor patient arrival and room availability throughout the day. (The assignment grids change color when patients arrive and when they are discharged.)

These assignment grids have improved communication among staff by clearly identifying the location and primary nurse caring for each patient and have also resulted in more efficient follow-up during treatment visits. With regards to the patient experience, we have seen our patient satisfaction scores improve with the establishment of a consistent nursing assignment.

### **Our Outcomes**

Using baseline data collected through observation and process mapping, our process improvement team identified the following improvements:

- Time from arrival to the completion of registration was decreased to 10 minutes
- Time to blood draw from completion of registration was decreased to between 10 and 15 minutes
- Drug dispense time was decreased to 30 minutes.

Management continually reviews data from the patient tracker and the EHR to ensure that the patient flow process is stable and to support new improvement efforts. Figure 3, left, shows the data we collect to measure patient flow from time greeted to registration complete. We have made some recent staffing and process changes, and we are using the patient tracker data to make adjustments and identify opportunities to further improve the process.

Patient satisfaction scores have continued to improve. We use a real-time satisfaction tool called Rate My Hospital to obtain daily feedback from patients, and we monitor our scores with a target score of 4.5 overall. (Following every patient visit, Rate My Hospital sends a text message with the survey.) We track multiple questions for wait time satisfaction, developing control charts to follow the stability of the patient flow process and to evaluate any process changes. Based on Press Ganey data on the implementation of the modified primary nursing model, we saw patient satisfaction with wait time in chemotherapy go from 83.6 in October 2013 to 91.7 in August 2014.

On a daily basis, management explores new opportunities to use the patient tracker to improve patient flow and the overall patient experience; the process improvement team continues to work closely with the web-based development team that has been critical to the success of this project. The cancer center is still challenged by the manual efforts required to update the patient status, but compliance with the tracker has improved. Further, continued review and quality improvement efforts by the staff and management team have made this tool valuable to staff and patients.

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Figure 4. Comparison of Practice Volumes, (Aug. 2013 to Sept. 2014)

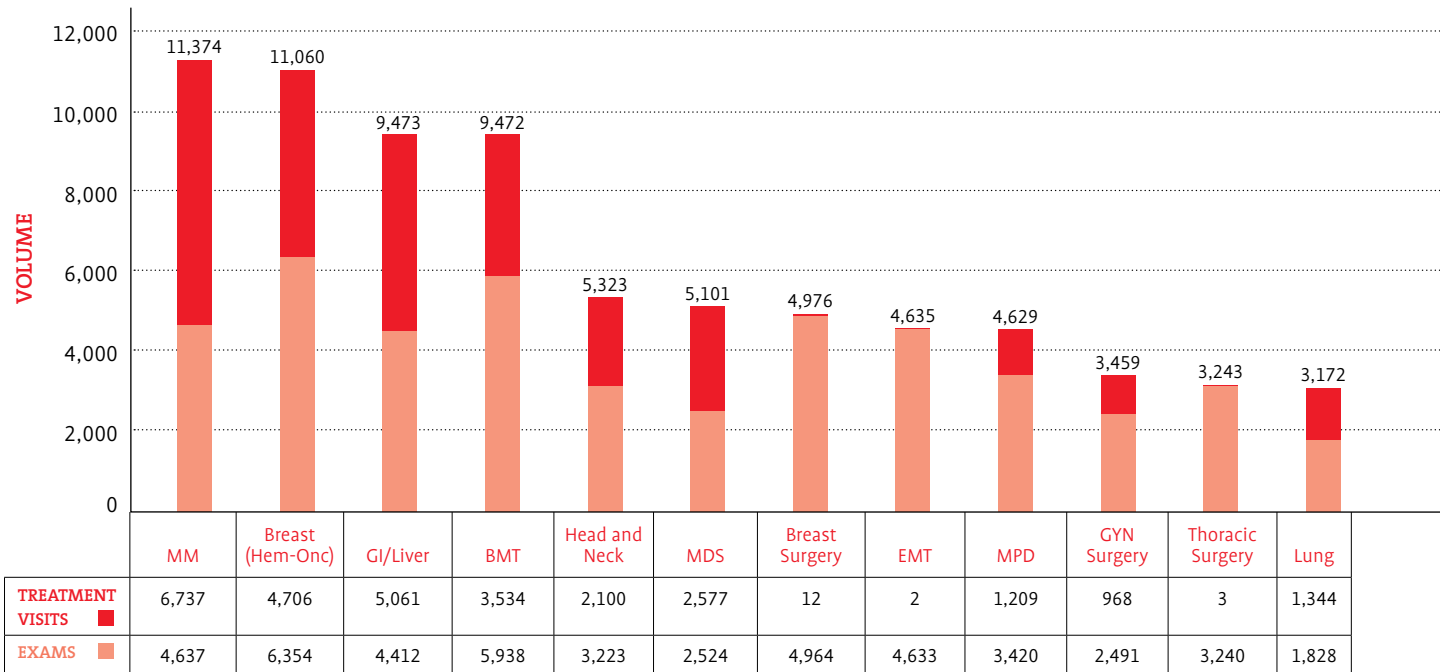
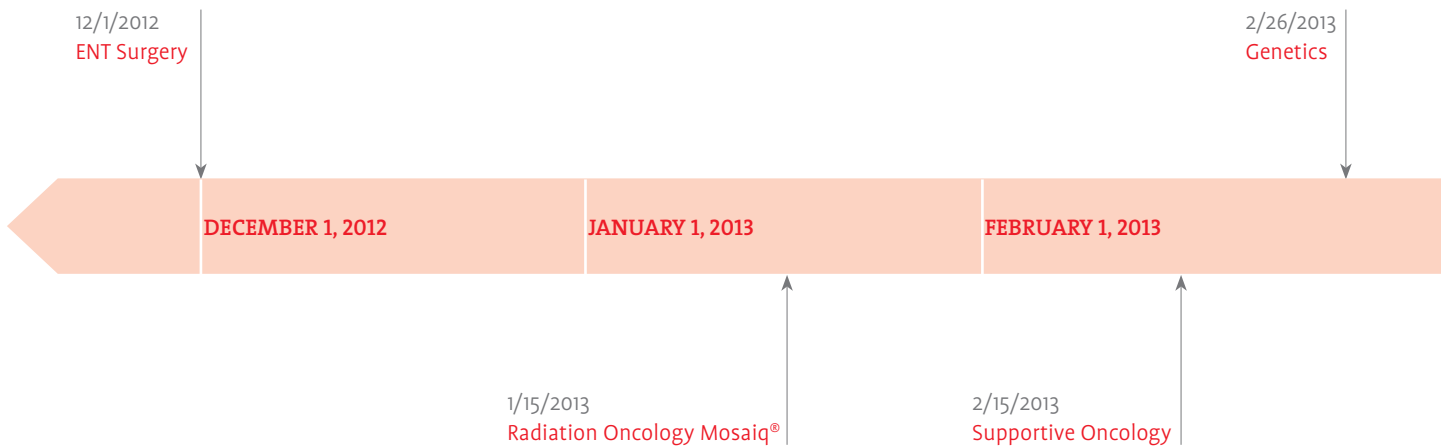
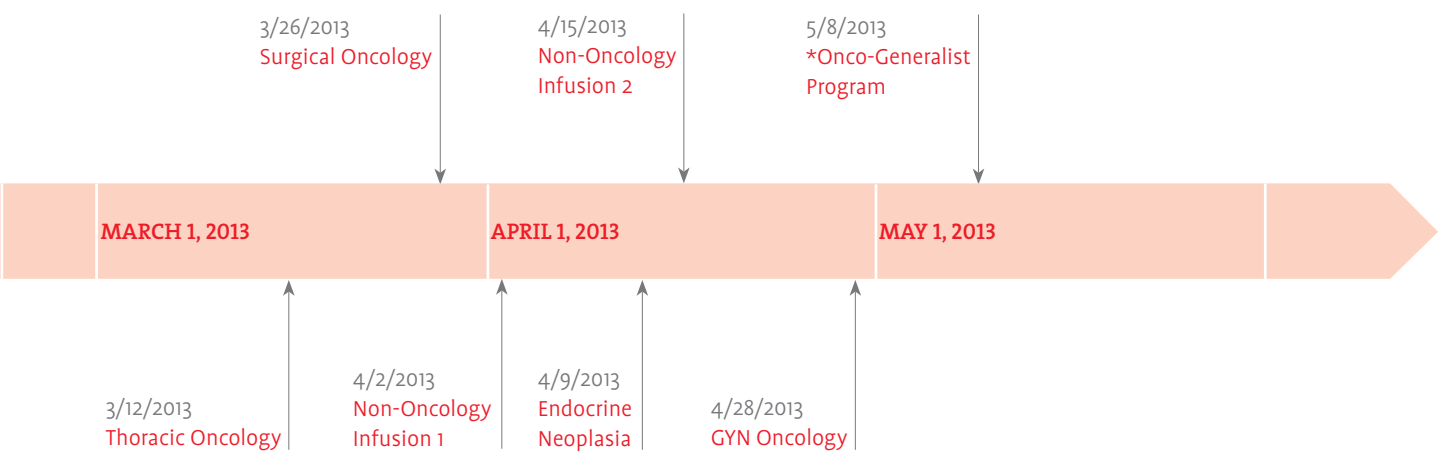
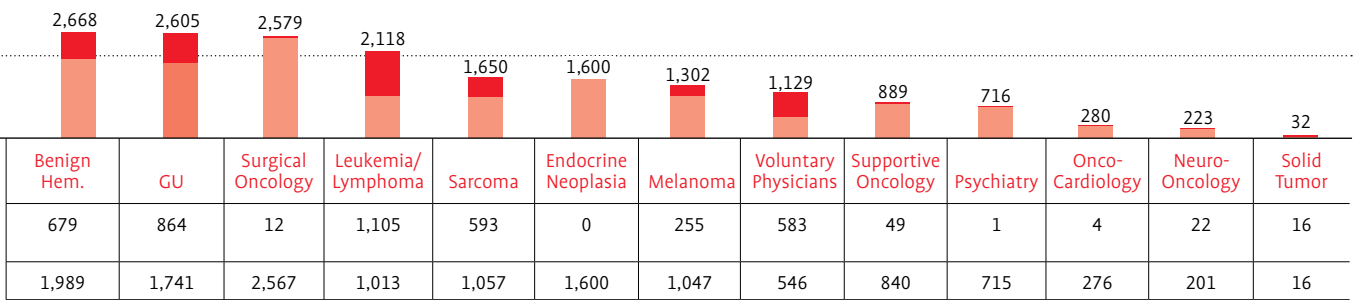



Figure 5. Ambulatory IT Planning Timeline







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The enhanced patient tracker is now being implemented at both the Dubin Breast Center and the new outpatient unit of the Cardiovascular Department and will soon be implemented throughout the Mount Sinai Health System. 

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## The Big Move Brings a New Care Delivery Model

ON OCT. 29, 2012, the Derald H. Rutenberg Treatment Center of the Tisch Cancer Institute moved to the third and fourth floors of the Leon and Norma Hess Center for Science and Medicine, New York, N.Y. Housed within one of the nation's top-ranked hospitals, Mount Sinai's Derald H. Rutenberg Treatment Center offers a wide range of outpatient services for all cancer diagnoses—with the exception of breast cancer patients who are treated at the Mount Sinai Dubin Breast Center, New York, N.Y. At its new location, the cancer center has 47 exam rooms and 54 treatment rooms and sees patients Monday through Saturday from 8:00 am to 6:00 pm. The average number of exam visits per day is between 250 to 300; the average number of daily treatment visits is 100. Figure 4, pages 34-35, shows the cancer center's practice volume from August 2013 to September 2014.

Surgeons, medical oncologists, radiation oncologists, a supportive care oncologist, an onco-psychiatrist, and onco-cardiologists all work together in the cancer center to provide patients with a coordinated approach to care. This multidisciplinary model requires support for complex patient visits, including new patient visits, multidisciplinary patient visits, metastatic patient visits, follow-up visits, and treatment visits. Patients navigate not just a single visit, but often a series of visits to complete the diagnostic process and obtain a treatment plan or follow-up services. To create this multidisciplinary model, our planning team started with a timeline (Figure 5, pages 36-37) to:

1. Integrate seven practices into the hospital-based cancer center.
2. Assist two programs that were not part of the cancer center—the Therapeutic Infusion Center (for non-cancer infusions) and the Genetics Infusion Center—in adopting the primary nursing model and using the patient tracker to assist with patient flow in their treatment spaces.

To help transition the practices into the hospital-based setting, we created an IT development team comprised of representatives from scheduling, the EHR (electronic health record) team, and the web team that developed our patient tracker. One of the challenges during this time of transition was understanding and designing the patient flow for surgical and radiation oncology patients. The practice flow of these new service lines was different from our existing medical oncology model where oncologists use the patient tracker to locate patients and coordinate treatment visits, and primary nurses use the tool to facilitate follow-up visits. Surgical oncology visits, for example, are often high volume and involve many disciplines and services, including pathology and speech therapy, and procedures such as ultrasound and scoping. Accordingly surgeons look to use this tracking tool to identify patient arrivals, expedite patient visits, and improve patient satisfaction scores for surgical oncology services.

Supportive Oncology and Psychiatry also required a special approach to patient visits, which involve psychosocial support services and symptom management. The supportive programs have a different patient flow than medical and surgical oncology. Scheduling templates were developed that met the needs of these specialized services, and the patient tracker reflected these unique requirements.

Our multidisciplinary model continues to evolve as new practices and new providers are added to increase services to our patients, including a Metastasis Center that coordinates visits for metastatic patients of all cancer diagnoses, a new patient navigation program that manages patient access, and an onco-generalist program. A strategic objective for this evolving new multidisciplinary model: to provide enhanced patient navigation by using the patient tracker to monitor patient progress and provide alerts to management if delays occurred.

