

The Philips Ambient Experience

Broward Health Medical Center partners to create a model infusion center



The adult infusion center at Broward Health Medical Center (BHMC), Fort Lauderdale, Fla., is currently comprised of 12 infusion chairs, two beds, and a cancer clinic. Historically, the infusion center has struggled with patient flow, less than optimal chemotherapy turnaround times, operational inefficiencies, and poor design and aesthetics, which ultimately translated to a poor patient experience.

The infusion center sees about 1,300 patients each month. A projected increase in infusion services projected for the near future coupled with a service market saturated with oncology providers underscored the need to transform the infusion service line into a world-class infusion center. Accordingly BHMC sought to identify a partner organization that could assist in revamping all aspects of the patient experience in its infusion center.

In January 2012 BHMC brought together a multidisciplinary team to oversee the selection of this partner and to manage the infusion center project. The team was comprised of the following stakeholders:

- Team leader Heather Miller, MSN, RN-BC, CPON, regional director, cancer service line
- Calvin Glidewell, CEO, BHMC
- Natassia Orr, COO, BHMC
- Hamilton Clark, CFO, BHMC
- Dennis Stefanacci, President/CEO, Broward Health Foundation
- Adele Holman, RN, OCN, coordinator, BHMC Adult Infusion Center
- Delia Guaqueta, MD
- Judith Bowden, RPh
- Karen Scheinberg, a representative from BHMC's Building and Design Department
- Diana Dominguez, manager of Facilities Services, BHMC
- Donna Haley, RN
- Architects from Perkins & Will
- Three patient advocates who were past patients at BHMC.

The team envisioned a redesign with a twofold purpose. First, the redesign would solve the issues related to the logistical aspects of treatment. Second, the redesign would differentiate BHMC by setting it apart from its competitors. The team believed that the end result would be a new concept in the delivery of quality cancer care.

The Philips Ambient Experience

BHMC's team engaged Philips in September 2012 based on the company's unique vision of the total patient experience

solution. Philips Ambient Experience designs services that aim to simplify healthcare by focusing on the people in the care cycle—patients *and* providers. By partnering with Philips, the team hoped to reduce patient anxiety and fear related to the hospital experience at each interaction while simultaneously maximizing efficiencies and throughput.

Guided by the principle of “value for people through valuing people,” Philips' in-house global team studies the world at a societal, cultural, and individual level to identify macro paradigm shifts, socio-cultural trends, and people's daily needs and desires. In an atmosphere that is psychologically supportive, a patient's experience is based on healing in its truest sense. The company's service is branded as the Philips Ambient Experience, bringing together healthcare solutions from design, process improvement, patient satisfaction enhancement, and operational efficiencies that:

- Integrate architecture and technology innovations, such as lighting, sound, projection, and RFID (radiofrequency identification), to create healthcare spaces that are unique and inviting
- Assist hospitals in creating immersive, multi-sensorial environments that enhance the overall hospital experience and change the culture
- Transform cold, impersonal environments into places that comfort and reassure.

The infusion center at Broward Health Medical Center was the first in the United States to utilize the Philips Ambient Experience.

A key element of the Philips Ambient Experience is the ability for patients to personalize their surroundings with lighting and other aesthetic features, giving patients an increased sense of control over their environment. Personalization benefits the patient by providing greater involvement in treatment, reduced anxiety, increased comfort, higher patient satisfaction, and reduced procedural or treatment time.

Improvements in the physical environment, coupled with process and culture changes, can have a positive influence on patients and their choice of where to receive cancer treatment—one of the key success metrics for BHMC's renovation project.

Getting Started

A five-day workshop was held in December 2012 with two consultants and one researcher from Philips who worked directly with internal and external customers of Broward Health. Philips analyzed turnaround times and efficiency of nursing and pharmacy, which

influenced staffing recommendations. Philips also evaluated relevant cultural and process issues that materially contribute to the patient experience. Research was collected through targeted patient and family interviews, staff interviews, charts and photographs of current flow, and shadowing of staff to determine current processes. The Philips team then developed solutions that it shared with the architectural firm, Perkins & Will, to help guide the redesign. Recommendations for lighting, art work, paint, storage, structure, and flow were mutually determined. Philips then developed processes to effectively communicate all improvements to BHMC's patient population.

Taking into consideration the needs of patients and staff, the collective goal was to design a solution that improved the quality of the patient's experience through technology.

Analyzing the Patient Experience

Mapping out the current experience helped reveal ways that efficiencies could be enhanced. Philips collaboratively created a "to be" patient experience map, illustrating the desired service experience at Broward Health Medical Center that would serve to drive and guide the redesign of the infusion center. During this process, the team discovered that the average patient made nine stops between the lobby, lab, treatment area, and check-out:

1. Entrance to the medical center
2. Check-in upon arrival to guest relations desk at the entrance to the hospital
3. Sit down in waiting area
4. Complete registration in the infusion center
5. Sit back down in waiting area
6. Draw blood work in the lab, located in the rear of the infusion center
7. Receive treatment in the infusion bays
8. Check-out at the registration area located at the entrance to the infusion center
9. Leave.

Broward Health's current and future scenarios were simulated more than 100 times using modeling software to determine potential outcomes. Flow of patients, staff, and lab results was reviewed across the infusion center. Registration, lab, chemo delivery, and treatment were also analyzed.

Based on observations, scheduling data, and simulation modeling, the team estimated average patient turnaround time at 2 hours and 29 minutes. Two months of scheduling data was received and analyzed, indicating an average of 34 patients treated per day, with 50 percent of all patients receiving chemotherapy. Other data revealed:

- The highest number of patients seen in a day was 50, and the lowest was 22
- No-shows represented 16 percent of all scheduled appointments
- Patients were scheduled based on their length of visit in order to maximize volume, but this scheduling often did not align with the ancillary services supporting the infusion

center (i.e., blood draw, pharmacy)

- Patient wait times increased and throughput was reduced by the suboptimal processes between blood draw and the delivery of the chemotherapy treatment
- Patients were immediately allocated to chairs—even though in some cases the drug was not available to treat them
- Patients were assessed once seated in a chair, which sometimes resulted in non-value resource allocation when patients could not be treated that day.

Scheduling, pharmacy, and resource allocation were determined to be factors impacting efficiency. The flow of patients, staff, lab results, and medications was observed across the infusion center. The team also analyzed current and future state scenarios to determine how new chairs and a redesign would impact the infusion center. Next, the team looked at current operational baselines and historical data to define a course of action. The following near-term improvement opportunities related to work and patient flow were then defined.

Operational Recommendations

Philips recommended the following steps to improve the patient, physician, and staff experience, while increasing revenues and reducing costs:

- Level load patient schedule to reduce no-shows and bottlenecks, which routinely consumed chair time, and to help ensure the proper patients were scheduled at the appropriate times.
- Perform root cause analysis on no-shows.
- Review pre-appointment process.
- Shift nursing resources to blood draw.
- Create patient record drop off and time.
- Assess constraint-based scheduling software. The computer software will not allow overbooking to ensure operational efficiency; all available time slots will be appropriately programmed for the treatment related times.
- Assess patients earlier in the appointment process.
- Use a signaling system to direct patients; visual cues to alert patients to next areas for treatment.
- Implement a patient status board.
- Draw blood work the day before the treatment appointment.
- Work with pharmacy to deliver just-in-time medication.
- Signal between pharmacy and infusion via use of an electronic message board derived from the EMR to help indicate where the patient is within the care process, which will reduce phone calls and confusion among providers.
- Dedicate a pharmacy to serve the infusion center.
- Use robotic technology to transport chemotherapy drugs, freeing up staff time.
- Assign nurses and patients to specific areas in the infusion center.
- Use EMR (electronic medical record) and CPOE (computerized physician order entry).
- Premix highest volume medications.

Revving-up Registration

Registration takes approximately seven minutes, but is highly variable due to patients who do not have pre-authorizations or who are not pre-registered. There is currently limited visual or electronic connectivity between registration, lab, pharmacy, and the infusion center, resulting in long turnaround times. A temporary area in the hallway is used to stage patients prior to blood work, and there is no line of sight between the main waiting area and the blood draw room. Additionally, there is no easy way to know if chairs are available in the main infusion area, or where patients should sit once they arrive.

The team suggested that patients would be processed in a more timely manner if patients registered, were quickly moved to lab and triage, and then escorted to their infusion suite for the day.

Minimizing Medication Delivery Delay

Medication delivery wait times at the infusion center are high. Philips identified several reasons for these delays:

- The infusion center is not provided information about when to expect medication delivery
- The infusion center pharmacist and nursing staff spend considerable time tracking down chemo medication due to limited line of sight
- Multiple medication checks are conducted between nurses and pharmacy staff prior to the treatment of patients
- All chemotherapy is custom-created on an individual basis once lab work is reviewed
- Resources are misallocated, for example, pharmacists being used to do low-value tasks, such as delivering medication to the patient's room.

Based on these data, it was clear that BHMC should restructure its process for getting medication from the pharmacy to the patient waiting in the infusion center.

The redesigned process includes improved line of sight and communication so that pharmacists and infusion nursing staff can easily determine where and when a patient's medications will be ready. A new dedicated pharmacy is being added to the infusion center, and robotic technology will be used to transport the chemotherapy from the pharmacy to the patient. In addition, clinicians will not have to travel to a variety of storage locations to gain access to supplies; instead, supplies will be built into each infusion station.

Improving Turnaround Time

As turnaround time was found to be an issue throughout the patient visit, Philips performed current state analysis and bottleneck identification to develop prioritized improvement recommendations. The team used a structured approach to capture the baseline environment and identify improvement opportunities by:

- Interviewing key stakeholders
- Collecting and reviewing scheduling and pharmacy cycle time data
- Gathering operational observations
- Modeling current and future state simulation scenarios.

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The team found that decoupled processes, batching (a process of making multiple patients chemotherapy medications at one time rather than per patient), and limited visual controls resulted in excess patient wait-times and underutilized beds and chairs. Observations and simulation results identified the preparation and delivery of medication from the pharmacy as the bottleneck. Once the bottleneck is resolved using the strategies discussed previously, the team suggested additional changes to improve turnaround time and throughput, including:

- Changing the pharmacy location and capacity
- Optimizing scheduling processes
- Aligning registration and blood draw resource capacity
- Changing the hours of operation at the infusion center (opening earlier and adding weekend hours)
- Increasing RN support of the blood draw processes.

A Better Experience for Patients & Staff

BHMC's redesigned infusion center, scheduled to open in March 2014, will provide a clear pathway for patients that enhances throughput. The infusion center will feature:

- 20 infusion chairs
- 2 beds
- An express clinic that will perform services, such as injections for stimulating agents, medi-port flushes, IV pump disconnects, and procedures or infusions that are less than 15 minutes
- A triage room
- A social services room
- A phlebotomy room.

The cancer clinics currently housed in the infusion center will move into the Physician Cancer Specialty Center, which will also provide a similar environment for physician visits, such as palliative care, surgical oncology, medical oncology, and GYN oncology. Maximum capacity of the new infusion center is projected to increase from 47 patients per day to 62 patients per day. The ultimate goal is to facilitate an environment in which clinicians will have more time to spend with patients and families. Key stakeholders were part of each decision to ensure that the space was both aesthetically pleasing and efficient. Ultimately, BHMC expects its innovative redesign to bring about an enriched patient and staff experience, a higher quality of care, and increased operational efficiency. 

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