The Health Care Improvement Foundation
2018 Delaware Valley Patient Safety and Quality Award
Entry Form

1. **Hospital Name**

   Jefferson Health

2. **Title Of Initiative**

   Engaging Patients and Caregivers during Chemotherapy through Digital Technology

3. **Abstract (Please limit this description to 250 words.)**

   The strength of a cancer patient's care network is a strong determinant of how well patients are able to cope with their chemotherapy. Patients undergoing chemotherapy often experience symptoms that influence their quality of life and trigger unnecessary ED visits or hospital admissions. Caregivers often take sole responsibility in monitoring treatment side effects, administering medication and overseeing their daily activities. One major challenge patients face regarding care is maintaining clinical engagement and streamlining communication amongst both caregivers and healthcare providers.

   Our Cancer Center established a Connected Care Program that involved 127 active chemotherapy patients self-reporting symptoms through their smartphones. A multidisciplinary team administered an 8-month implementation and patient enrollment process for all disease-types at one campus. Our clinical champions built a set of complex algorithms and processes embedded in the digital technology that customizes trending rules to detect and direct information to the appropriate responder within the network. Year-to-date, we've engaged 57 physicians, 80+ nurses and frontline staff with plans to implement and enroll 1000+ patients enterprise-wide by the end of the fiscal year.

   The concept of using digital platform is fundamental in streamlining communication between patients, caregivers and their healthcare providers. If patients are engaged and able to self-report outcomes at least once a day, providers are more aware of side effects, and can intervene before symptoms worsen and cause serious downstream complications.

4. **What were the goals of your initiative?**

   The overarching goal was to develop and pilot a digital platform that prompts patients and caregivers to self-report 12 common cancer symptoms using the National Cancer Institute (NCI) evidence-based criteria for adverse events (PRO-CTCAE). Our framework was modeled after a similar study that was published in the Journal of American Medical Association. These include:

   - Build a platform technology that engages patients to self-report symptoms
   - Connect and centralize communication to caregivers regarding symptom care plans and activity reminders

- Provide clinicians a mechanism to standardize triage, intervene early and track clinically relevant trends for patients undergoing active therapy

Our long-term objectives are to evaluate the utilization of the digital platform to improve patient self-monitoring during active therapy, enhance quality of life and reduce unnecessary ER visits.

5. **What were the baseline data and the results of your initiative?**

A multidisciplinary team designed and implemented a Connected Care Program across 8 oncology groups impacting all cancer disease-types for an 8-month duration. On daily basis, patients and/or caregivers were prompted to record symptoms on a 5-point scale (Figure 1). The clinical thresholds built were around severity, frequency and interference with an associated clinical alert for when symptoms exceeded an acceptable safety threshold. Patients are prompted to call into our Oncology Phone Room for immediate triage (<30 minutes). The Phone Room registrars document the patient information into their EHR, noting patient as 'high priority' before sending the call to a centralized triage nurse.

Of the 225 patients screened, 127 (56%) were enrolled into the program. In addition, 11 caregivers served as patient proxies. In terms of demographic information, more than half of the enrollees were Caucasian (59%) and women (60%). The average age of enrolled patients was 64 while the average age of patient proxies was 44 years old. Patients with breast cancer (63%) and pancreatic cancer (22%) represented the highest enrollment for disease-types. In addition, stage 2 cancer diagnosis appeared the most interested in monitoring symptoms (Figure 2).

Over the 8-month duration, patients had 88 clinical alerts triggered with only 10% of those patients contacting their care teams. Alternatively, since nurses received notification for every clinical alert, they took immediate clinical action more than 85% of the time when patients reported severe or worsening symptoms. The triage nurse utilized an existing oncology pathway to review interventions, discuss medication regimen and provide recommendations on whether to stay home, go to same-day clinic or the emergency department (Figure 2). At the next clinical appointment, doctors received symptom reports that include self-reported symptoms with a severity number over a 30-day view. This directly engages both patient and caregiver to their cancer care treatment (Figure 3).

6. **Describe the interventions that were instrumental in achieving the results for your initiative.**

Key interventions included:
- A multidisciplinary team contributed significant co-development and clinical expertise regarding the platform algorithms, user interface and functionality. Clinical providers built questionnaires with conditional logic and thresholds that trigger clinical alerts. Core team designed onboarding, triage algorithms and clinical visit workflows for medical assistants, nurses and physicians that can be replicated at any outpatient clinic.

- A structured Connected Care Program was created with a patient-centered design focus. Onboarding occurred in the IC with each patient and in-person, ensuring extensive time to review application functions and discuss protocols for monitoring symptoms.
- To enhance patient/caregiver awareness on the initiative, administrators created prescription Rx sheets for providers to give to patients during a clinical visit, which encouraged patients to enroll in the program and report symptoms daily.
- To engage providers in co-development, the platform was customized to incorporate the NCI-validated PRO-CTCAE scale and data display over a 30-day view to examine clinically relevant trends over the course of a patient's treatment cycle, oral therapy plan, medication, etc.
- Administrative and clinical leadership held a weeklong event for heightened patient/caregiver enrollment and education.

7. **Describe the key steps required to successfully replicate this initiative throughout the region. (Please limit this description to 100 words.)**

   Our systematic approach can be replicated throughout the region and expanded to outpatient clinics due to the operational protocols created to optimize care coordination and caregiver activation. Through the utilization of evidence-based criteria for adverse events, PRO-CTCAE, NCI-institutions are able to standardize questionnaires and automate nurse triage processes.

8. **Explain how the initiative demonstrates innovation (Please limit this description to 100 words.)**

   The digital platform demonstrates innovation by bridging the gap between the clinic and home, providing real-time patient-reported measures that drive early interventions in a timely and informed manner. Care teams generated seamless data presentation and critical symptom measures. Most notably, the Huddle Report was built to rank order patients with elevated symptoms that should be addressed during the visit (Figure 4). The institution is currently in process of using a EHR scheduling appointment interface to capture new patients with ease, and assign current patient appointments with symptom recordings.

9. **How does this initiative demonstrate collaboration with other providers within the continuum of care? (Please limit this description to 100 words.)**

   The expected benefits for the patient population are sharing in critical decisions and receiving support from a trusted network of providers, family and friends. At the institutional level, the expected benefits are caring for patients through the continuum of care, streamlining communications between institutions and patients and reducing health-care costs.

10. **Explain ways in which senior leadership exhibited commitment to the initiative (Please limit this description to 100 words.)**

    CEO/President and Cancer Director have provided their full support for this platform and partnership. We have promoted that the Connected Care Program will be fully operational, impacting all cancer disease states by Dec-2018. Leadership has provided 3 additional FTEs to focus efforts on sustainability, expansion and outcomes.

11. Appendices (i.e., tables and graphs)

Appendices-HCIF

FIGURE 1
Screenshots of mobile application

FIGURE 2
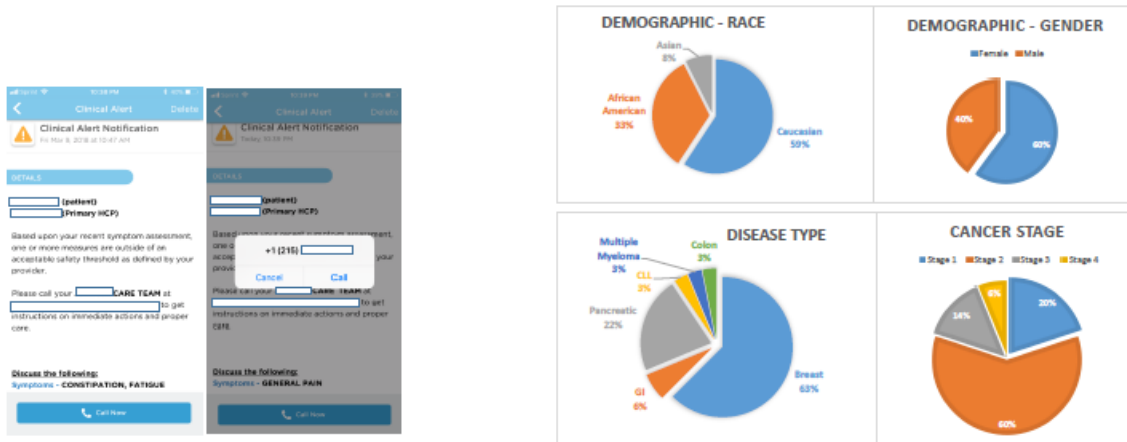Demographic information of 127 patients enrolled into the program

FIGURE 2 CONTINUED
Sample triage log showcasing patient symptom, advice provided and time to answer call (goal <30mins)

Symptom	Advice Given	Care Team Aware	Call In/Out	EE	Clinic	Hom	Time to Answer (Mins)
Constipation	MO: Relieved with mag-citrate, will follow-up on Friday with	Y	Out			x	18 mins
Hot Flashes	MO, EDU: Talked about management and educated on some unknown	Y	Out			x	3 mins
Hot Flashes	MO, EDU: Talked about management and educated on some unknown	Y	Out			x	2 mins
Loss of Appetite	MO, EDU: Talked about adding in Ensure or smoothies. Keeping food	Y	Out			x	25 mins
Fatigue	MO, EDU: Talked about management and educated. Will follow-up wit	Y	Out			x	2 mins
Pain	MO: Talked about pain medication regimen. Working well.	Y	Out			x	36 mins
Loss of Appetite	EDU: Will see about nutritionist contacting patient to go over good food	Y	Out			x	12 mins
Pain	Headache, will monitor. Try dilaudid and rest, will call for update tomor	Y	Out			x	8 mins
Fatigue, Neuropathy, Hot Flashes	MO, EDU	Y	Out			x	1 hr 11 mins
Pain, Decrease Appetite, Hot Flashes, Cough	MO, EDU: Went over interventions, discussed medication regimen. Wi	Y	Out			x	17 mins
Pain	Continue to monitor headache. Will follow-up Thursday with	Y	Follow-up Out			x	
Pain	Followed up to see if appt with [ ] was made. Was not yet, wi	Y	Follow-up Out			x	30 mins
Pain, Hot Flashes, Cough	MO, EDU: Educated on interventions, will follow-up with care team if we	Y	Follow-up Out			x	20 mins
Pain, Hot Flashes, Cough	MO, EDU		Frequent Flyer, no more f/u unless symptoms change/worsen				
Pain, Hot Flashes, Cough	MO, EDU		Frequent Flyer, no more f/u				

FIGURE 3
Provider dashboard data report showcasing patient symptoms over a 30-day period

FIGURE 4
During chart prep, the **Huddle Report** was designed by physicians to discuss and allocate time for patients coming into clinic with elevated symptoms