Developing a Cancer Patient Navigation System: Usability Results

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INTRODUCTION

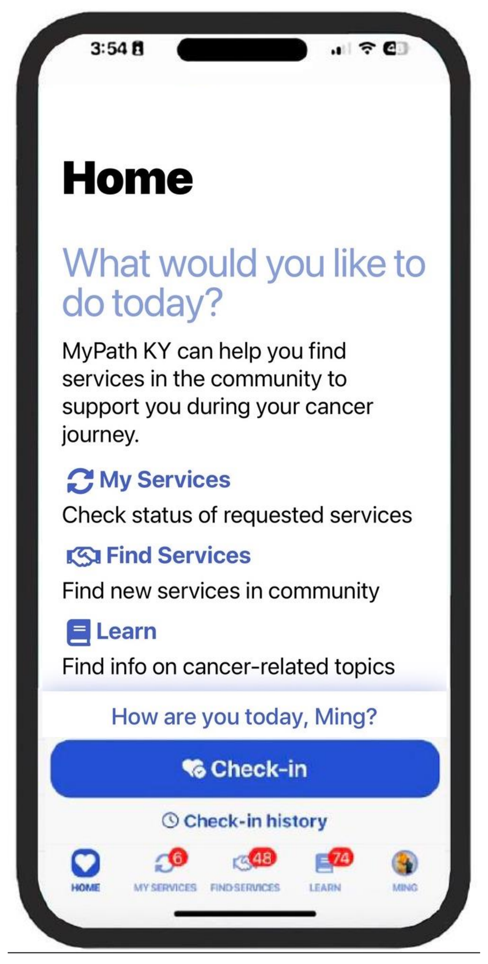
Patient navigation, a new billable service under Medicare Part B, can improve outcomes by removing barriers to care (e.g., finding temporary lodging near the treatment facility).[1-2] Information and communication technology, such as smartphones, can remotely connect cancer patients with their navigators, enabling continuous support during treatment.[3]

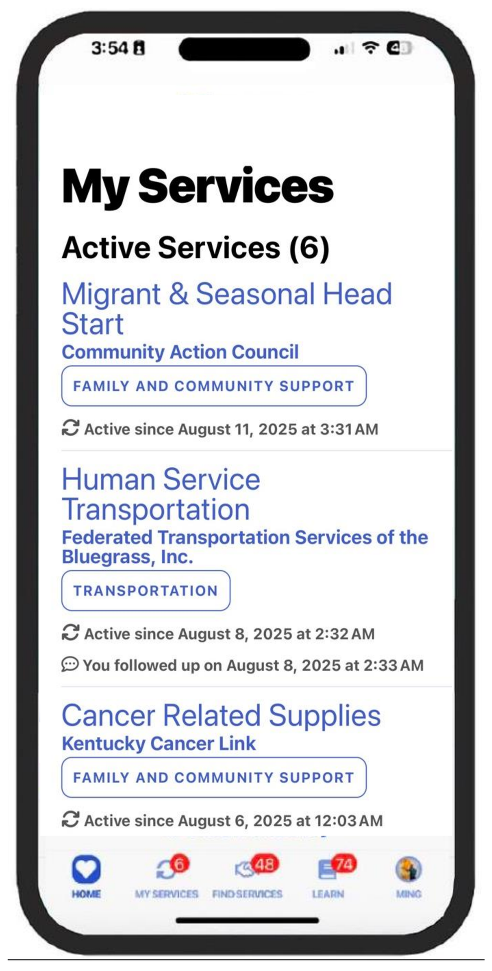
We co-designed a cancer patient navigation system, including a smartphone app for patients and a web-based dashboard for patient navigators.

We report here the initial usability results of these two human-centered care-support tools.

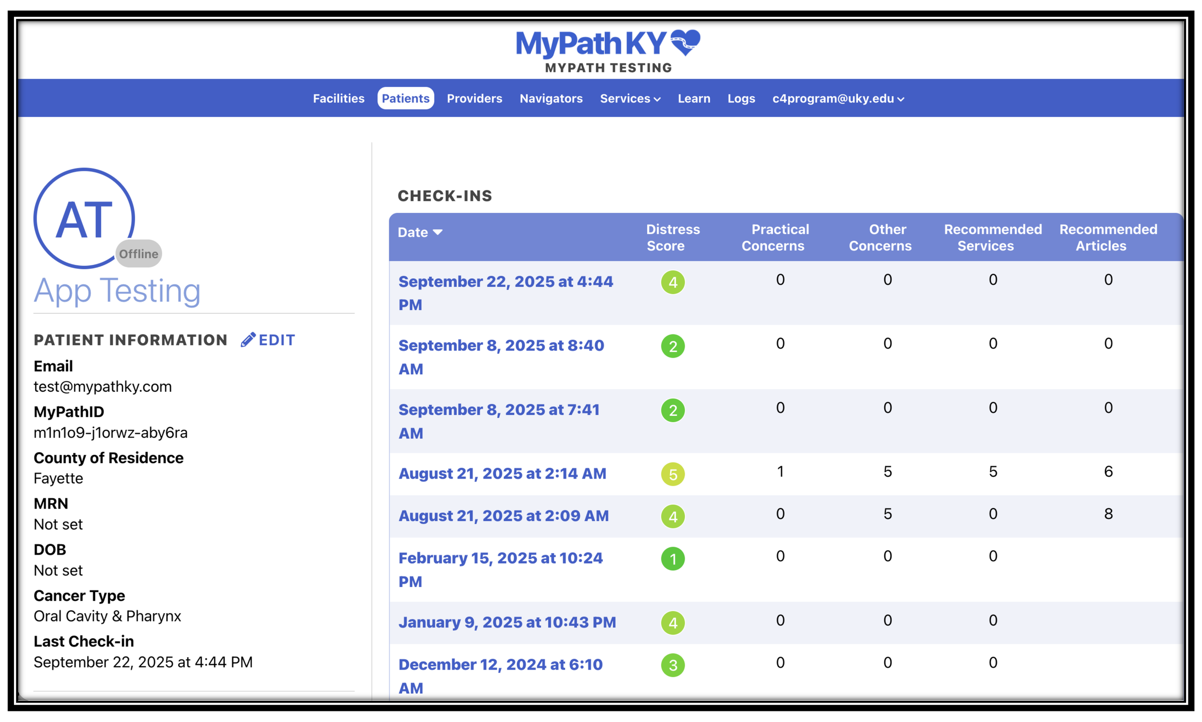
MyPathKY Navigation System

The patient app offers tools to report cancer-related concerns, based on which, the app recommends community services and provides guidance and follow-ups to ensure that patients receive services.





Navigators receive email alerts about patients' high-level distress, review their concerns and service status, suggest additional services, and connect patients with services **via the web-based dashboard**.



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METHODS

Participants. Five newly diagnosed adult cancer patients with identified social needs and six psycho-oncology patient navigators from the University of Kentucky (UK) Markey Cancer Center joined a one-time usability testing session from Spring 2024 to 2025.

Procedures. Participants were asked to test respective tools by following the scenarios. Scenarios cover real-world use cases (see examples below). After testing, participants completed a survey.

Patients. *"You have an upcoming appointment but were too weak to drive yourself. You also do not have extra money to pay a cab. Please browse and search for a transportation resource in the app. Please find contact information for a specific organization."*

Navigators. *"You (the navigator) have just arrived to work and need to locate the patients in greatest need. What do you do?"*

Instruments. NASA task load index[4] (**NASA-TLX**, item scored -10 "less effort or easy to use" to 10 "most effort or difficult to use"), **System Usability Scale[4]** (**SUS**, scale scored 0 "worst usability" to 100 "best usability"), and **Mobile Application Rating Scale[5]** (**MARS**, item scored 1 "worst" to 5 "best").

Analysis Plan. Descriptive statistics were reported below.

RESULTS

Five patients (average age 49, 60% female, 40% white, 40% black) have different cancer diagnoses. Six navigators (50% female, mostly white, one African American) shared 24 years of combined experiences in cancer navigation (ranging from 1 to 14 years)

MARS	Mean (SD)
Engagement	3.76 (0.64)
Functionality	3.85 (0.82)
Aesthetics	3.93 (0.43)
Information	4.30 (1.90)
Overall App Quality	3.95 (0.85)
Recommend	4.40 (0.89)
Future Use	3.20 (0.45)
Willing to Pay	2.40 (1.95)
Star Rating	3.50 (0.58)
Increase awareness	4.20 (0.84)
Increase knowledge	4.50 (1.29)
Encourage me to seek help	4.75 (0.50)
Address barriers	4.50 (0.58)

NASA-TLX & SUS	Patient App Mean (SD)	Navigator Dashboard Mean (SD)
NASA - Task Load Index		
Mental demand	-7.0 (2.74)	-4.3 (5.68)
Physical demand	-5.6 (4.93)	-9.5 (0.84)
Temp. demand	-7.8 (2.17)	-8.6 (1.51)
Performance	-5.0 (5.95)	-5.0 (6.32)
Effort	-7.5 (2.89)	-7.0 (2.83)
Frustration	-4.0 (6.60)	-8.2 (3.13)
Overall	-6.0 (3.69)	-7.1 (2.59)
Systems Usability Scale		
SUS	76 (8.77)	85.8 (5.63)

- Patients and navigators reported high SUS scores, indicating **acceptable usability**. Negative NASA-TLX scores showed **overall ease of use**, but the ***frustration (patient app)*** and the ***mental workload (navigator dashboard)*** were areas of the highest task load.
- From MARS results, the patient app has **good app quality**, better than the threshold value at 3. The ***willingness to pay*** for the patient app (M=2.4, SD=1.9) is lower than other usability outcomes, likely due to patients' struggles with social needs.

CONCLUSION

Both the patient app and navigator dashboard were easy to use with good usability though the sample size was small. Our patient navigation system is currently being updated and tested in a quasi-experimental trial.

ACKNOWLEDGEMENTS

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