

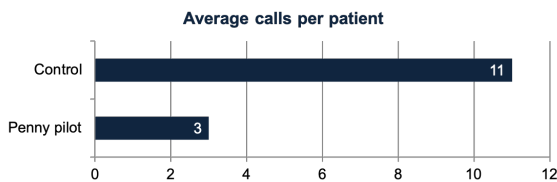
# LEVERAGING A CONVERSATIONAL AGENT TO SUPPORT ADHERENCE TO ORAL ANTICANCER AGENTS: A USABILITY STUDY

## BACKGROUND

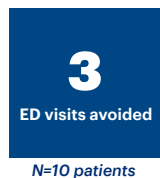
Identifying effective, scalable strategies to ensure patient adherence to oral anticancer agents (OACAs) is a major challenge. Previous studies have shown widely variable rates of adherence, and suboptimal adherence is associated with decreased effectiveness and higher costs. A small but growing literature supports digital health behavioral interventions across a variety of chronic illnesses, including in cancer. In particular, conversational agents—or technologies that mimic human conversation using text or spoken language—have shown early promise in supporting behavior change, but have yet to be rigorously tested in the context of OACAs.

## OUTCOMES

### Reduces Call Volume



### Prevents Unnecessary ED Visits



*"When you are in the moment feeling that sick, you aren't thinking straight. Penny was the straight-thinker we needed at those times."*

## METHODS

A rapid cycle prototyping approach led to the development of 'Penny'—a bidirectional, conversational agent that engages patients via text messaging, and leverages natural language processing and machine learning to learn from clinical interactions. Core functionalities include: (1) real-time dosing instructions, (2) motivational reminders, and (3) symptom monitoring with self-management support.

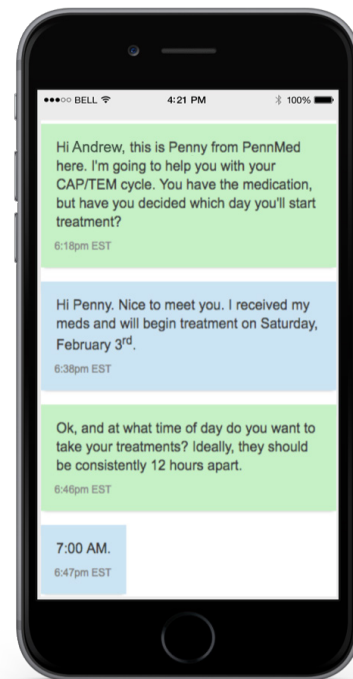
We conducted a four-month usability study between December 24, 2017 and May 1, 2018 in a large academic cancer center. At monthly intervals for the first 12 weeks of follow-up, research staff conducted qualitative interviews with participants to evaluate usability and acceptance.

## RESULTS

11 patients with gastrointestinal neuroendocrine cancer on capecitabine and temozolomide were approached regarding the study. Of these, 10 agreed to participate (ages 45 to 71). Overall, participant satisfaction was high with a Net Promoter Score of 100. Reliability of Penny's algorithmic branching to provide accurate dosing information and symptom triage was also high: symptoms were accurately graded 100% of the time, and there was appropriate self-management advice or provider triage 100% of the time. Average daily adherence (based on self-report) was 98%. Participants reported that 3 emergency room visits were avoided during the study period.

## CONCLUSION

In preliminary testing, a mobile phone-based conversational agent was a usable and acceptable means of supporting OACA adherence. Expanded to study patient safety and efficacy are underway.



[▶ WATCH VIDEO](#)  
An AI powered application, known as Penny, provides personalized guidance and support for patients undergoing chemotherapy treatment.