SymptomPal: an artificial intelligence chatbot to facilitate remote symptom reporting for patients with advanced lung cancer

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Executive summary

Objectives

1. Develop SymptomPal, an AI symptom chatbot, using principles of human-centered research design.
2. Determine feasibility of SymptomPal for symptom reporting.
3. Assess acceptability of SymptomPal to patients and oncology clinicians.

Activities: We propose a mixed methods study to develop and test feasibility/acceptability of an artificial intelligence (AI) chatbot, SymptomPal, for patients with stage III/IV thoracic malignancy

Outcomes: SymptomPal will be considered feasible if ≥70% of intervention arm participants report symptoms through the chatbot ≥3 times over 12 weeks (primary feasibility outcome). SymptomPal will be considered acceptable if ≥50% of patient and clinician interviewees rate the program's Net Promotor Score (NPS) ≥7 and Positive System Usability Scale (Positive SUS) ≥70 (co-primary acceptability outcomes). We will triangulate survey and qualitative data to assess program acceptability.

Challenge

A hallmark of the cancer experience is heightened anxiety around new or worsening symptoms. **"Symptom vigilance" is both protective and burdensome:** while patients want to report symptoms early, the constant uncertainty about what is clinically significant contributes to emotional distress, repeated calls to clinical staff, and unnecessary emergency visits.
SymptomPal can fill this gap by providing an on-demand, streamlined way to report symptoms and then give oncology clinicians a concise summarization about the patient's symptoms that can be used to formulate recommendations.
Patients are an integral part of the development and refinement of SymptomPal before it is tested in a randomized pilot study. **Input from patient experts** ensure that the study endpoints are meaningful to individuals living with lung cancer.

Advocates in human-centered research design

Direct involvement of patient experts

We will develop SymptomPal using Human-Centered, Evidence-Driven Adaptive Design (AHEAD), an evidence-based framework integrating human-centered design with health services research methods in a 5-step process for intervention development. **Dr. Sydney Barned (patient advocate) incorporated her lived experience** via the AHEAD process:
Step 1*: *Develop the problem. By describing her own experiences with symptom vigilance, Dr. Barned provided key insights by describing the uncertainty patients face when deciding whether to report symptoms to their oncology team.
Step 2: Gather information from people with lived experience. Dr. Barned reviewed patient interview data from a survey-based symptom monitoring pilot program. Participants' request for humanlike dialog led our team to explore AI chatbots.
Step 3: Establish guiding principles. In December 2025, Drs. Barned and Agne will meet in person at the American Cancer Society National Lung Cancer Roundtable Annual Meeting to develop a moderator's guide for patient and clinician focus groups to provide key insight into the development of the SymptomPal prototype.
Step 4 (Prototype Development) and ***Step 5 (Pilot Testing)***: Dr. Barned will continue meeting with the research team monthly to provide key insights on data collected from focus groups, pilot testing, and participant interviews.

Incorporating feedback

Patient feedback is incorporated throughout all steps of the AHEAD framework. We would like to highlight the following areas where insights from Dr. Barned's lived experience are incorporated in the research design process:

1. **Co-development of focus group and interview guides.**
2. **Selection of survey measures measuring usability and acceptability of the intervention.**
3. **Triangulation and interpretation of participants' survey and interview data.**
4. **Dissemination of study findings.**

Drs. Barned and Agne co-designed a poster presentation highlighting the AHEAD approach for their SymptomPal proposal to be presented at the American Cancer Society National Lung Cancer Roundtable Annual Meeting on 8 December 2025.

Impact on study design

Dr. Barned provided critical feedback on the premise and goals of this SymptomPal proposal. Specifically, she questioned *"How will the system know when a patient needs to speak with a clinician or nurse about their symptoms? How will you ensure patient safety?"* Questions like these led our research team to select the AHEAD framework to guide development of the SymptomPal prototype as it systematically incorporates patients' feedback throughout the intervention design process.

As both a patient and physician, Dr. Barned provides the unique perspective needed to develop a symptom communication tool that efficiently conveys patients' symptom concerns to oncology clinicians who can offer recommendations to provide timely and effective symptom relief.

conclusions

Inclusion of patient advocates in human-centered research design:

- Facilitates patient-centric healthcare interventions.
- Ensures study endpoints are meaningful to people living with cancer

1 **Applying for the pre-application grant**

2 **Activities proposed**

3 **Outcomes & incorporating them back into endpoint and trial design**

Providing pre-application funding for patient involvement

A new grant mechanism called "pre-application grants" has been launched. These small grants are to close the funding gap for patient experts to provide input to the development of a grant application/protocol.

We are aiming at supporting patient organizations during this early phase with a budget. The budget should be planned to cover travel costs to preparatory meetings and the work time invested by staff or patient experts. This work should be carried out as a preparation step prior to the submission of a clinical research grant application to RTFCCR

4 **Conclusion**