W H I T E P A P E R

Oncura

AI-Assisted Cancer Care Navigation and Patient-Provider Communication Support

A YouEmpowered Initiative · 2026

Abstract

Cancer patients face two acute, underaddressed friction points: selecting an oncologist aligned with their practical and personal preferences and communicating daily symptom experiences during brief outpatient visits. Oncura is an AI-powered platform developed by YouEmpowered, a youth-led 501(c)(3) nonprofit, to address both challenges. The platform combines an intelligent oncologist-matching engine—drawing on natural language processing of public physician data and patient-defined preference weights—with a low-burden symptom tracker that generates structured, visit-ready appointment summaries. This white paper describes the community problem, technical architecture, AI methods, validation approach, ethical guardrails, and planned next steps. Oncura is designed to reduce patient anxiety, improve clinical communication, and support more informed, confident cancer care decisions.

1. Community Problem

Each year, more than 2 million Americans receive a cancer diagnosis—a moment that immediately confronts patients and their families with high-stakes, time-sensitive decisions. Through interviews with cancer survivors, caregivers, and oncology clinicians, the YouEmpowered team identified two distinct and persistent pain points that existing tools fail to address adequately.

1.1 Navigation Overload: Choosing the Right Oncologist

After diagnosis, patients must rapidly identify an oncologist who matches their cancer type and stage, insurance network, geographic proximity, and availability. In practice, most patients default to their primary care physician's initial referral—a referral that rarely accounts for the interpersonal qualities patients consistently report as most important: communication style, emotional support, and lived clinical experience.

The downstream consequences are significant. A systematic review found that 27–31% of patients seeking a second opinion were motivated by dissatisfaction with their physician's

communication. A separate study found that 36.6% of breast cancer patients transferred care between institutions due to dissatisfaction—a disruption that delays treatment and strains outcomes. Even patients who proactively search for a physician find public information fragmented across hospital websites, provider directories, and review platforms, turning what should be a days-long decision into weeks of uncertainty.

Finding	Source
27–31% of patients seeking a second oncology opinion cite communication dissatisfaction	*Hillen et al., The Oncologist, 2017*
36.6% of breast cancer patients transferred care due to dissatisfaction with their doctor	*Bleicher et al., Breast Cancer Res Treat, 2019*
65.2% of cancer patients said an oncologist selection tool would be “somewhat” or “very” important	*McLarty et al., AJMC, 2022*

1.2 Communication Gaps During Outpatient Treatment

Once treatment begins, patients experience symptoms and side effects daily—yet outpatient oncology visits average only 17 to 23 minutes. Research demonstrates that 40–80% of medical information is forgotten immediately after an appointment. Together, limited time and imperfect recall create conditions where meaningful symptom patterns go undetected until they escalate.

Electronic patient-reported outcomes (ePROs) have demonstrated clinical value: randomized trials have shown improved quality of life, overall survival, and fewer emergency hospitalizations when symptom monitoring is used. However, existing ePRO programs generate alert fatigue for clinicians and demand too much of patients. In a cross-study analysis of over 100,000 participants in remote health monitoring programs, median retention was just 5.5 days.

Key Gap *Existing tools optimize for clinician dashboards, not patient experience. Oncura inverts this: a patient-first design that also produces structured, clinician-ready information.*

2. Solution Overview

Oncura is a two-module AI platform. Each module targets one of the documented friction points, and both share a unifying design principle: AI should reduce burden, not add to it. Oncura does not make medical decisions. It structures information, surfaces preferences, and bridges the communication gap between patients and their care teams.

2.1 Intelligent Oncologist Matching

Oncura’s matching engine enables patients to find oncologists who align with both their practical constraints and their personal definition of a “good fit.” The pipeline proceeds through four stages:

- Provider profile assembly from vetted public databases (Virginia Cancer Specialists, U.S. News), normalized for consistent specialty labels, address formats, and hospital affiliations.
- NLP feature extraction from physician reviews and biographies, converting raw text into human-readable attribute scores across nine dimensions: communication, emotional support, experience, knowledgeability, technical skill, personal connection, responsiveness, wait-time, and approachability.
- Patient preference capture via a short intake form that collects both logistical inputs (insurance, geography, diagnosis) and desired physician qualities, weighted by importance.
- Weighted scoring and ranking that aggregates attribute scores using patient-defined weights, applies hard constraints (insurance network, distance), and generates an explainable compatibility score for each physician.

A key design decision: the system presents the reasoning behind each match—not a black-box score. Patients can see why a doctor ranked highly and adjust weightings to reflect their own priorities.

2.2 Symptom Tracking and Visit Summaries

Between appointments, patients complete a brief daily check-in using intuitive severity sliders (1–10) for pain, fatigue, and side effects. Optionally, they record a 60-second voice journal, which is transcribed via speech-to-text. This design minimizes data-entry burden for patients who may be fatigued or unwell.

NLP is applied to both quantitative check-in data and transcribed journals to identify meaningful trends: persistent nausea, rising pain severity, new symptoms following a medication change, or missed dosages. These signals are then used to generate a one-page, LLM-drafted appointment summary organized into structured sections: General Overview, Noteworthy Symptoms and Trends, and Missed Dosages.

Critically, patients review and may edit the summary before sharing it with their clinician electronically or in print. This keeps the patient—not the algorithm—in control of the narrative.

3. AI Methods and Technical Architecture

Oncura's AI components were developed using a combination of commercially available large language models, natural language processing libraries, and custom scoring logic.

3.1 NLP for Physician Attribute Scoring

Provider reviews and biographies were scraped from public sources and passed through OpenAI's API using a fixed scoring rubric. The model was directed to identify category-specific language: phrases such as "good listener" and "takes time to explain" were treated as signals for

communication quality; language indicating warmth or reassurance was attributed to emotional support. All outputs were constrained to nine predefined attribute categories, producing normalized 0.0–1.0 scores per physician.

To address bias in online reviews—which skew toward extreme experiences and vary by platform and demographics—the team chose thematic NLP extraction over raw star ratings. When an oncologist has too few reviews for reliable signal extraction, Oncura discloses this limitation directly to users rather than masking data sparsity.

3.2 Matching Algorithm

Patient preferences are captured across nine weighted dimensions. A scoring function aggregates physician attribute scores using patient-defined weights, regularizes results to a 0–1 scale, and applies hard constraints for insurance and location. ZIP codes are standardized using the pgeocode library; AI-assisted review was used to validate and update outdated entries. The final output is a ranked list of physicians with explainable match percentages.

The team validated that rankings respond predictably to preference changes: when a patient's location preference was shifted from "not important" to "very important," a physician located 6 miles away jumped from a 93% to a 98% match. Distinct preference profiles consistently yielded different top-five recommendations.

3.3 Symptom Tracking and LLM Summary Generation

Daily check-in data and voice-journal transcripts are processed by a lightweight analytics layer to detect trends (e.g., worsening severity over a 7-day window, new symptoms post-medication-change). These signals are passed to an LLM with a strict generation template: one-page limit, three fixed sections, neutral observational language, no diagnostic claims, and a requirement that every summary bullet point be traceable to at least one patient-logged data point. Unsupported content is excluded rather than inferred.

3.4 Rapid Prototyping and Design Iteration

Before building production components, the team used AI-assisted prototyping platforms (Lovable, Figma Make) and prompt engineering with large language models (ChatGPT, Gemini) to rapidly generate and stress-test user interface designs. Early prototypes were found to contain too many competing interface elements; successive iterations consolidated features, reduced decision load, and introduced clearly labeled icons—all informed by the principle that cancer care is a high-anxiety environment where cognitive burden must be minimized.

4. Validation

Each component of Oncura was validated through a combination of statistical testing, human review, and behavioral experimentation.

4.1 Statistical Validation of Physician Attribute Scores (TOST)

To confirm that GPT-generated physician attribute scores were consistent and reproducible, the team ran the same scoring prompt twice across the full physician dataset in independent sessions. Two One-Sided t-Tests (TOST) for equivalence were conducted using Python's SciPy library, with a pre-specified equivalence margin of $|\delta| = 0.06$. Both one-sided tests produced p-values below 0.05 ($p = 7.4 \times 10^{-10}$; $p = 0.049$), confirming that the two score datasets were statistically equivalent within the defined tolerance.

4.2 Human Review of Physician Rankings

In parallel with statistical testing, the team manually verified that physicians with the strongest credentials, most awards, and most positive reviews consistently received the highest attribute scores—providing a face validity check on the NLP outputs.

4.3 Preference-Driven Ranking Validation

The team tested whether rankings respond appropriately to changes in stated preferences. Holding all variables constant except preference weights, switching the priority between communication and location produced predictable and reproducible shifts in the top-five recommended physicians—confirming that the matching algorithm is preference-driven and not arbitrary.

4.4 Appointment Summary Accuracy

The LLM generation pipeline was validated through a traceability system: the model is instructed to link every summary bullet to a specific patient-logged data point. Claims that cannot be traced to patient input are flagged for review or removed. This guardrail directly addresses the hallucination risk inherent in generative AI applied to medical contexts.

5. Responsible AI and Ethical Guardrails

Oncura was designed with the recognition that AI tools in clinical-adjacent contexts carry heightened obligations. The following principles governed every design decision:

Minimal Data Collection

Symptom logging is limited to non-invasive inputs. Optional fields are genuinely optional. Patients control which data is used for summarization and may edit summaries before sharing. Where possible, patient identities are separated from symptom content.

Transparency

Every oncologist recommendation includes an explanation of why the physician ranked highly based on the patient's stated preferences. Every summary bullet is traceable to user-input data.

Oncura does not present recommendations as authoritative—it presents them as structured, explainable information to support patient decision-making.

No Medical Advice

Oncura does not offer diagnoses, treatment recommendations, or clinical interpretations. Appointment summaries use deliberately neutral, non-prescriptive language (e.g., “symptom to discuss with your clinician”). Symptom tracking is designed to improve communication, not to replace clinical judgment.

Uncertainty Disclosure

When physician review data is too sparse for reliable NLP extraction, Oncura discloses this to the user. When patient-logged data is incomplete or ambiguous, the backend makes uncertainty visible rather than implying clinical confidence. Hallucination risks are mitigated by strict prompting and traceability requirements.

Equity Considerations

Oncura’s matching engine accounts for geographic distance and insurance network, ensuring that patients in underserved communities are not inadvertently steered toward inaccessible options. The parent platform, YouEmpowered, includes multilingual translation tools—a direct response to identifying language as a barrier during clinic outreach.

6. Challenges and Solutions

Challenge	Solution
Data fragmentation across provider directories	Normalization layer standardizes specialties, locations, and affiliations; records that cannot be confidently merged are flagged rather than forced.
Review bias and sparse data	NLP extracts thematic signals rather than relying on star ratings; sparse-data physicians are disclosed to users.
LLM hallucination in visit summaries	Summaries are constrained to patient-logged inputs; traceability checks exclude unsupported claims.
Privacy and consent	Minimal required fields, optional inputs truly optional, clear consent flows, and no generation of medical advice.
Distance calculation at scale	ZIP code standardization via pgeocode; AI-assisted validation of extracted codes.

7. Impact and Next Steps

Oncura addresses two moments where cancer patients are most likely to make decisions with incomplete information and high anxiety: choosing a physician, and communicating their experience between appointments. By making the doctor-selection process transparent and preference-driven, Oncura aims to reduce the rates of second-opinion transfers and care disruptions that currently affect tens of thousands of patients annually.

During treatment, the symptom tracker creates a reliable longitudinal record that patients own and clinicians can review efficiently—without the alert fatigue that plagues existing ePRO systems. The result is a lower likelihood that concerning trends are missed, and a stronger sense of patient agency in a situation that often feels disempowering.

Planned Next Steps

- Expand the provider database with additional fields: appointment availability, telehealth options, and languages spoken.
- Solicit structured clinician feedback to refine ranking weights and appointment summary formats for real-world utility.
- Run a small consenting-user pilot measuring time-to-decision for physician selection, perceived visit clarity, and early identification of concerning symptom trends.
- Integrate financial navigation and support-group resources into the platform.
- Explore privacy-preserving use of aggregated feedback to improve matching personalization over time.

About YouEmpowered	*Oncura is a flagship initiative of YouEmpowered, a youth-led 501(c)(3) nonprofit. Across its programs, YouEmpowered serves patients, caregivers, and underserved communities through cancer literacy, caregiver support, multilingual outreach, and community building. The team welcomes partnerships with clinicians, researchers, and health organizations interested in piloting or expanding Oncura.*

8. Reflections

Building Oncura reinforced a core insight: the most impactful AI systems in healthcare are rarely the most sophisticated—they are the ones that fit most naturally into the lives of people under stress. Cancer care is a high-anxiety environment where small reductions in friction produce meaningful relief. Every design decision—from the one-page summary limit to the optional voice journal—was made with that reality in mind.

The team also learned that empathy is a design requirement, not a soft add-on. Wording, tone, and user control determine whether an AI tool reduces or compounds anxiety. Oncura's north star throughout development was not technical sophistication but patient experience: Does this make a hard moment slightly easier?

AI is strongest when it augments human decision-making rather than replacing it. Oncura is built on that premise—keeping patients, caregivers, and clinicians in control, with AI serving as a translator between fragmented information and confident, informed decisions.

References

[1] American Cancer Society. Cancer Facts & Figures 2025. American Cancer Society; 2025.

[2] Hillen MA, et al. Patient-driven second opinions in oncology: a systematic review. The Oncologist. 2017;22(10):1197–1211.

[3] Bleicher RJ, et al. Treatment delays from transfers of care and their impact on breast cancer quality measures. Breast Cancer Res Treat. 2019;173:603–617.

[4] National Academies of Sciences, Engineering, and Medicine. Delivering High-Quality Cancer Care. National Academies Press; 2013.

[5] McLarty S, et al. Provider and patient insights into the cancer care journey. Am J Manag Care. 2022;28(7):314–320.

[6] Guy GP Jr, Richardson LC. Visit duration for outpatient physician office visits among patients with cancer. J Oncol Pract. 2012;8(3 Suppl):2s–8s.

[7] Kessels RPC. Patients' memory for medical information. J R Soc Med. 2003;96(5):219–222.

[8] Basch E, et al. Overall survival results of a trial assessing patient-reported outcomes for symptom monitoring during routine cancer treatment. JAMA. 2017;318(2):197–198.

[9] Pratap A, et al. Indicators of retention in remote digital health studies: a cross-study evaluation of 100,000 participants. NPJ Digit Med. 2020;3:21.

[10] President's Cancer Panel. Enhancing Patient Navigation with Technology to Improve Equity in Cancer Care. November 2024.

YouEmpowered is a youth-led 501(c)(3) nonprofit dedicated to improving cancer literacy and empowering patients to make informed decisions. Learn more at youempowered.info.