

UPMC Mercy Vision Institute Outpatient Medical Center Design Research Highlights

[2024.12.19 draft]



Motivation – UPMC Mercy Vision Institute aims to become a “Care Space” for low-vision and blind patients.

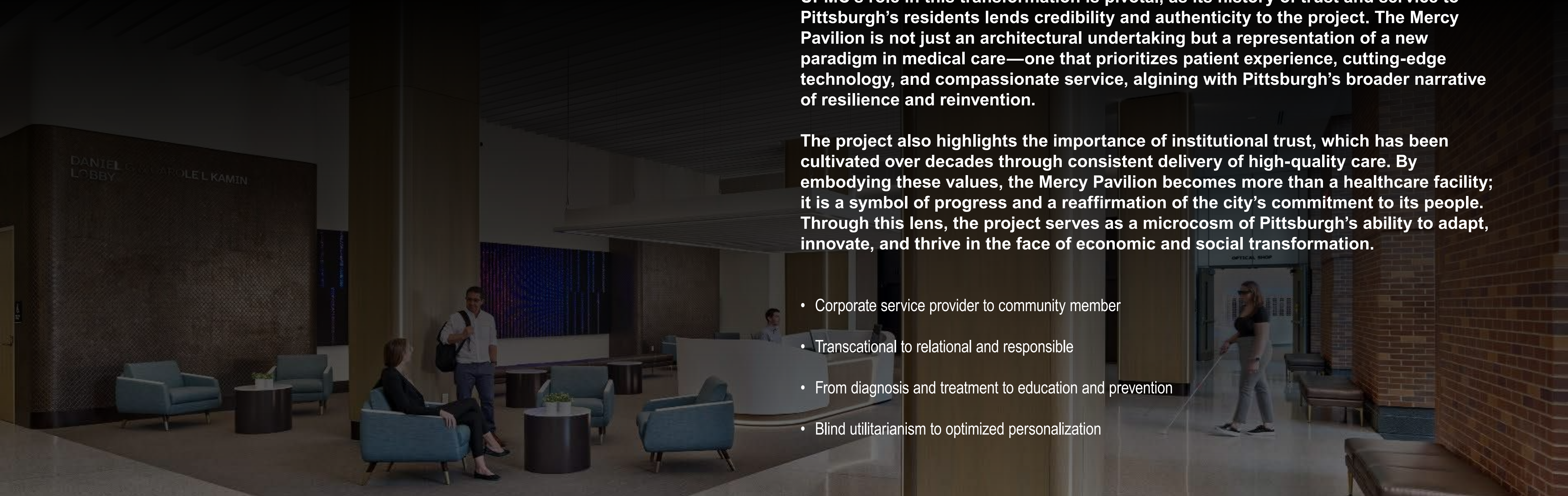
UPMC Mercy Pavilion and the Vision Institute redefines the epistemology of American healthcare

The Mercy Pavilion project exemplifies the evolution of Pittsburgh as a city that has successfully transitioned from its industrial roots to a leader in innovation and healthcare. This initiative is emblematic of the city’s broader transformation, showcasing how its institutions have adapted to meet the needs of a changing economy while maintaining a strong connection to the community.

UPMC’s role in this transformation is pivotal, as its history of trust and service to Pittsburgh’s residents lends credibility and authenticity to the project. The Mercy Pavilion is not just an architectural undertaking but a representation of a new paradigm in medical care—one that prioritizes patient experience, cutting-edge technology, and compassionate service, aligning with Pittsburgh’s broader narrative of resilience and reinvention.

The project also highlights the importance of institutional trust, which has been cultivated over decades through consistent delivery of high-quality care. By embodying these values, the Mercy Pavilion becomes more than a healthcare facility; it is a symbol of progress and a reaffirmation of the city’s commitment to its people. Through this lens, the project serves as a microcosm of Pittsburgh’s ability to adapt, innovate, and thrive in the face of economic and social transformation.

- Corporate service provider to community member
- Transcational to relational and responsible
- From diagnosis and treatment to education and prevention
- Blind utilitarianism to optimized personalization



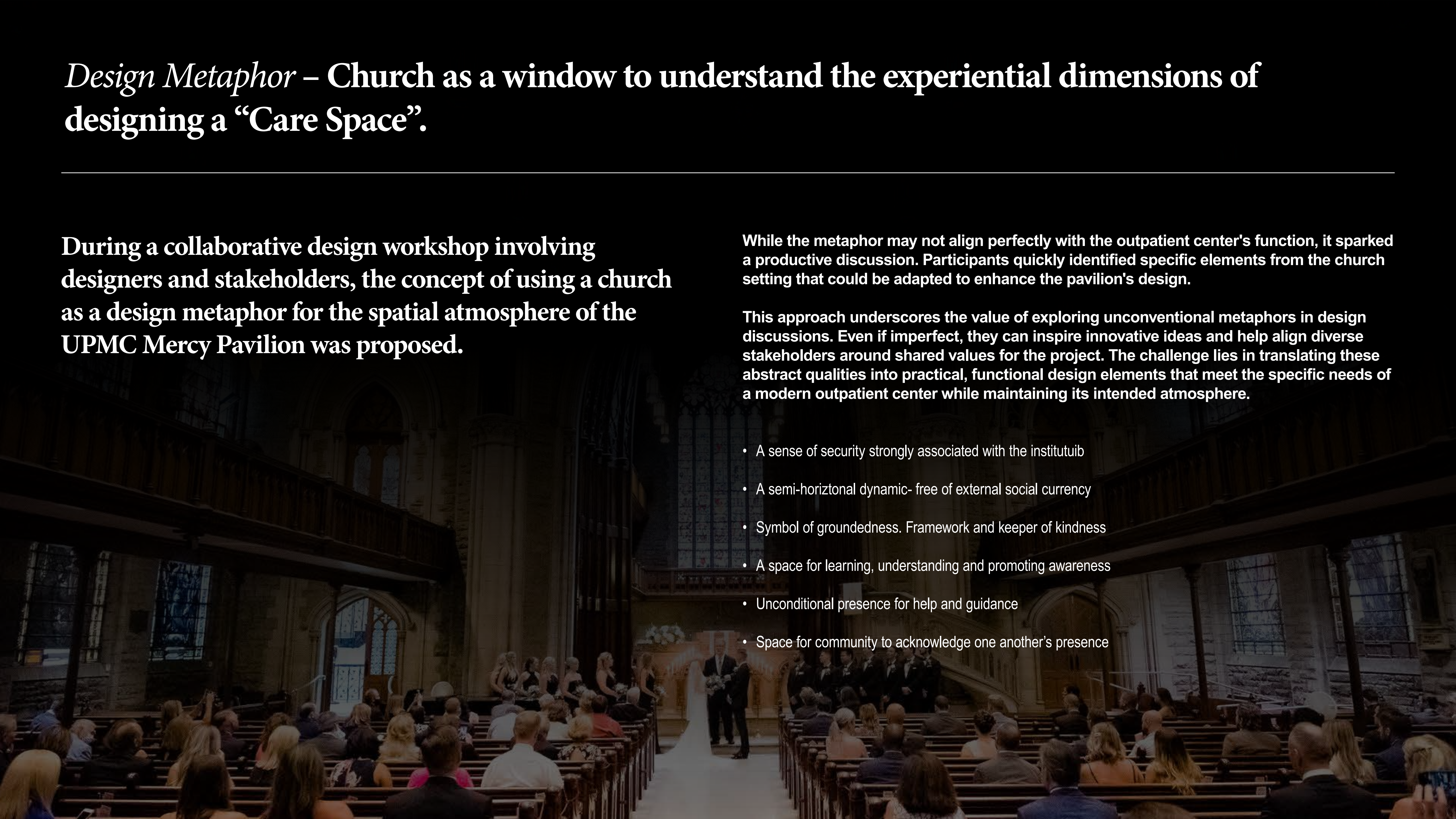
Design Metaphor – Church as a window to understand the experiential dimensions of designing a “Care Space”.

During a collaborative design workshop involving designers and stakeholders, the concept of using a church as a design metaphor for the spatial atmosphere of the UPMC Mercy Pavilion was proposed.

While the metaphor may not align perfectly with the outpatient center's function, it sparked a productive discussion. Participants quickly identified specific elements from the church setting that could be adapted to enhance the pavilion's design.

This approach underscores the value of exploring unconventional metaphors in design discussions. Even if imperfect, they can inspire innovative ideas and help align diverse stakeholders around shared values for the project. The challenge lies in translating these abstract qualities into practical, functional design elements that meet the specific needs of a modern outpatient center while maintaining its intended atmosphere.

- A sense of security strongly associated with the institution
- A semi-horizontal dynamic- free of external social currency
- Symbol of groundedness. Framework and keeper of kindness
- A space for learning, understanding and promoting awareness
- Unconditional presence for help and guidance
- Space for community to acknowledge one another's presence



A willingness to ask for health information did not always result in access

Evidence – Ethnographic studies and interviews highlight varying levels of health literacy among patients and little action to resolve the prevalence of user ambiguity, potentially escalating into a wicked problem.

QUOTE FROM
"HEALTH LITERACY NEEDS OF PEOPLE WITH VISUAL IMPAIRMENTS"

Ability To Obtain Health Information

"A willingness to ask for health information did not always result in access."

Types of hurdles to accessing to health information

Obtain

Process

Understanding

Personal factors	Timely exposure	Practical barriers	Logistical barriers
Privacy	Format of information	Type of instruction	Applying information to themselves

HOW DOCTOR'S WORK

Technician/Specialist/Engineer/Speaker

D

Nystagmus Diagnostic Workflow

Child with nystagmus

Detailed ophthalmological/neurological history and examination

Current pathway

New pathway

Infantile nystagmus confirmed

Optical coherence tomography

Eye movement recording

Electrophysiological tests

AMG trials

Genetic testing

Saliva or blood sample obtained

DNA screened on NGS panel

Variant analysis

Pathology identified

Management

Each patient is different, but from the doctor's perspective, they have to make technical decisions that will increase the probability of a positive health outcome. The decision tree diagram demonstrates how generalized the patient becomes through the lens of a technician, dismissing hurdles each individuals face.

HEALTH LITERACY VICIOUS LOOP

negative feedback loop of low health literacy

Tendency for lower health literacy

Appalachian region case study

Less healthcare opportunity

Increasing Medical Cost

Increased premium

More financial burden

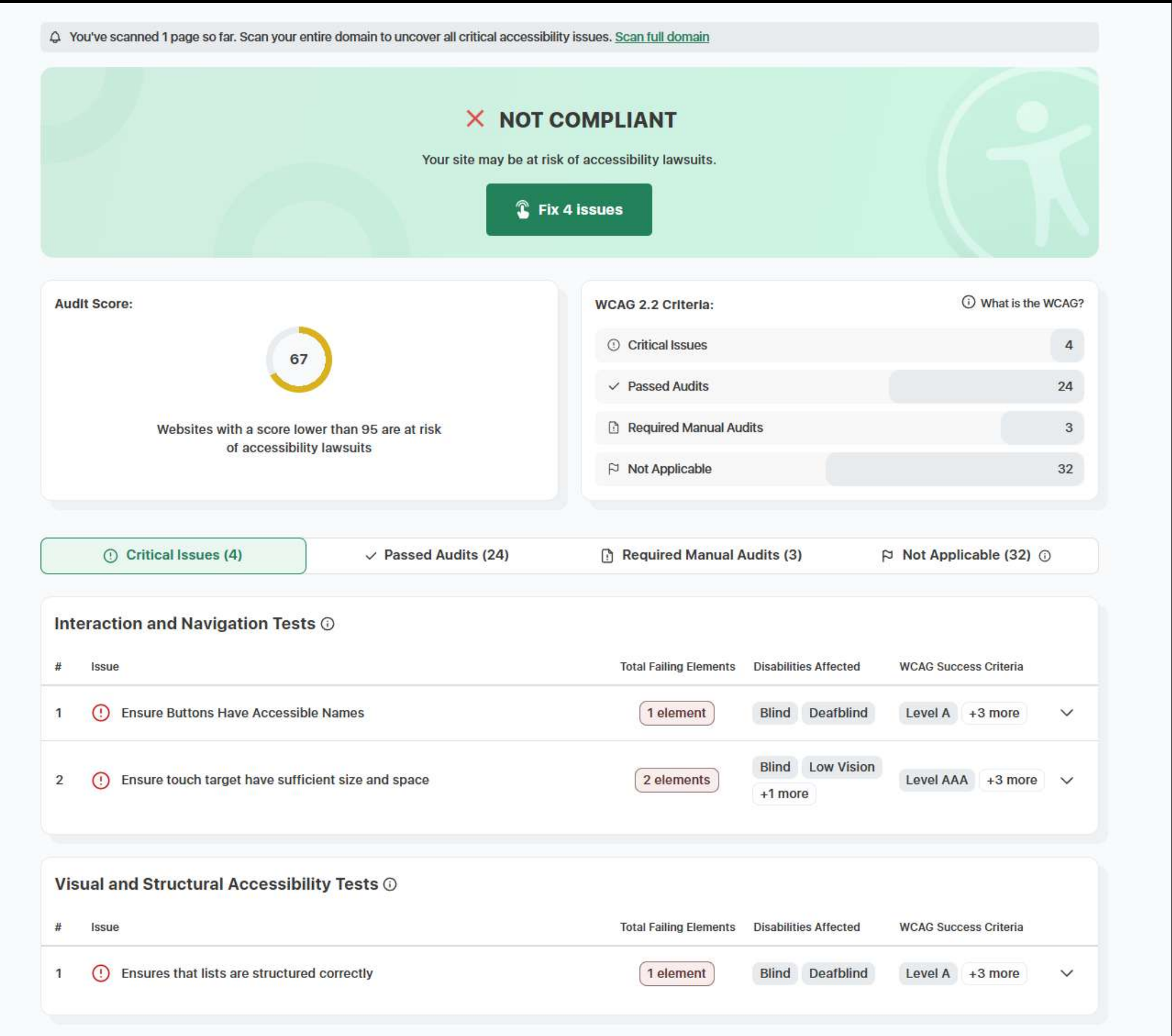
There are intergenerational impacts of low health literacy as well. Health literacy is not only for you, but also for your children.

Ease of personal access or low barrier for simple things such as asking a question is not only informs the patient but also establishes a sense of care and security

Investigation funneled down to the topic of language and information. Possessing a unified currency to anchor and stabilize unnecessary user frustration was the challenge central to building the groundwork for an effective system integration. Establishing the lower-level parameters can effect the underlying mechanism and intention when designing the service.

This research touches base both on how to ensure semantic clarity and how these “responders” should be placed across the service blueprint.

Challenge – Design myopia: UPMC system integration hinders service accessibility for high-risk patients, poisoning medical cost escalation and a spiraling institutional burden.



Majority of medical care services operate as a hybrid-environment framework, requiring patients or their caretakers to often navigate ambiguously designed services, causing user frustration through uncertainty, cognitive demand, lack of control, and most of all receiving a sense of service inadequacy while paying high cost.

UPMC's website page, which is the portal for patient services including that of the Vision Institute, fails to comply to the WCAG guidelines, rendering user navigation and interaction with the site extremely difficult without supervision.

The lack of an integrated system with the UPMC Health Plan site, as well as unintuitive information architecture and menu categorization highlights the larger picture of how the current UPMC system will likely cause various experiential frictions to solidify the trust it intends to showcase.

As much as high barrier for accessing necessary services is a concerning topic, it systemtically promotes a more difficult state of mind for stakeholders to obtain and retain information - especially information pertitent to patient's diagnosis or follow-up care processes for patients who recently received treatment.

A possible scenario would be patients growing frustrated with the service or even upset due to the difficulty of leveraging the service features to receive medical care.

Numerous psychological studies identify that stress and anger causes the ability for sustained focus, which is necessary for the more intense interactions with doctors and hospital staff members. A sense of anxiety may also cause significant affective burden, harming the objective create a space for patients' peace of mind and comfort.

Even a minor gap in communication quickly grows into a overwhelming challenge in hyperconnected systems like health care. Awareness of the extensiveness and scale that the model of health care encompasses reflects the invisible damage of complacency.

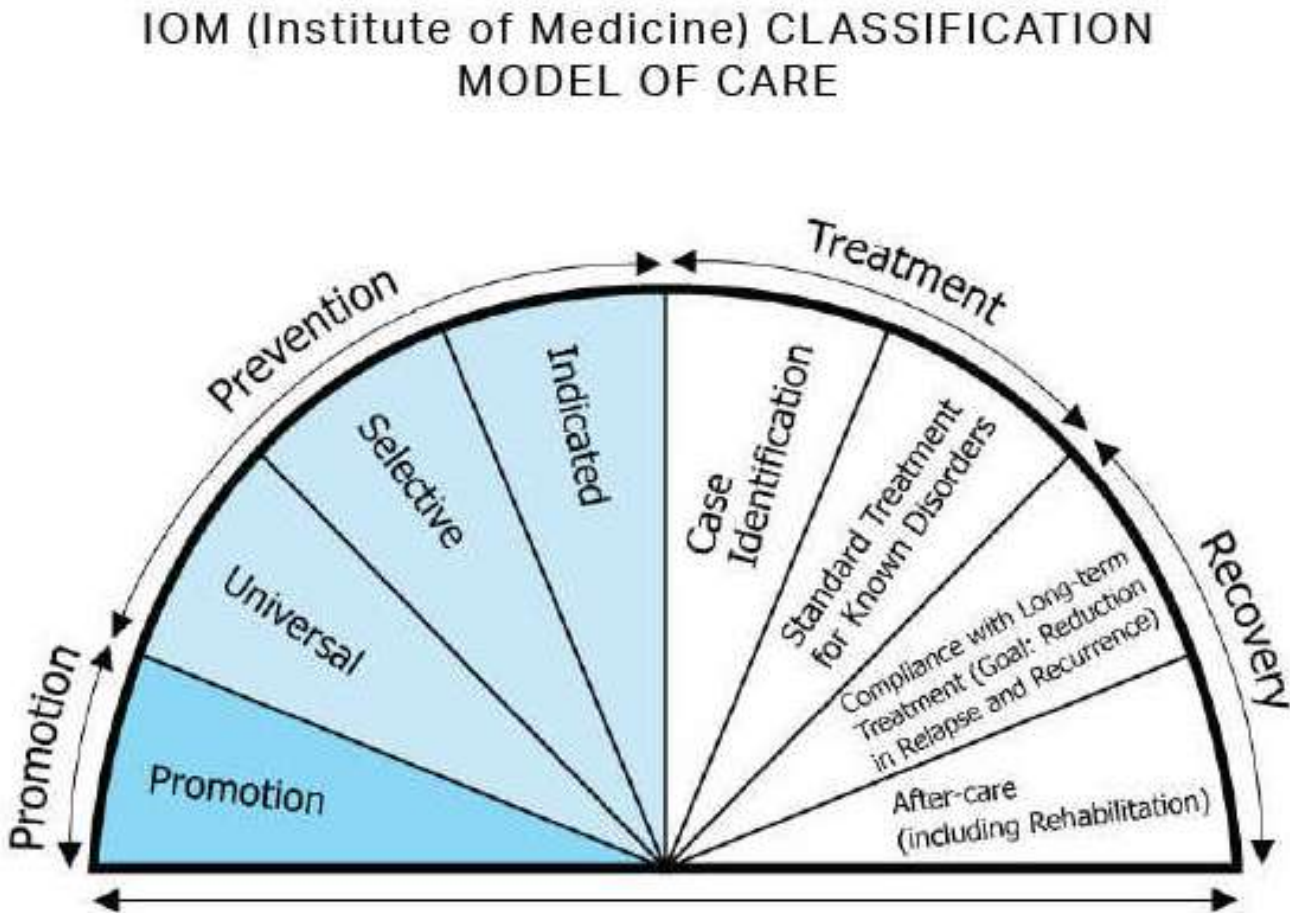
IMPLICATIONS OF LOW HEALTH LITERACY

- **An Economic Drain**— Low health literacy is a major source of economic inefficiency in the U.S. healthcare system. An initial approximation places the order of magnitude of the cost of low health literacy to the U.S. economy in the range of \$106 billion to \$238 billion annually. This represents between 7 percent and 17 percent of all personal healthcare expenditures.
- **The Financial Burden in Perspective**— The savings that could be achieved by improving health literacy – a lower bound of \$106 billion and an upper bound of \$238 billion – translate into enough funds to insure every one of the more than 47 million persons who lacked coverage in the United States in 2006, according to recent Census Bureau estimates.
- **A Huge Burden for Future Generations**— When one accounts for the future costs of low health literacy that result from current actions (or lack of action), the real present day cost of low health literacy is closer in range to \$1.6 trillion to \$3.6 trillion. This measure is relevant to guide choices about where the social investment might go today.

Health literacy allows hospitals to reinvest in other sectors of the healthcare system such as medical coverage.

Based on an average of **\$1000 extra per admission for patients challenged with literacy, the increased cost to hospitals alone is \$12.6 billion dollars per year.**

Your average mid-sized community hospital that sees 5000 admissions per year spends an additional \$1.8 million dollars covering the costs associated with low health literacy.



The IOM Continuum of Care Model demonstrates that healthcare is about providing an end-to-end care for the patient. This also means there are multiple facets that can be redesigned to improve patient's experience.

Takeaway #1– Stakeholder matrix illustrates that a well-trained staff is essential and technology should be a complementary measure to prevent work overload.

Patient Group	Needs	Challenges	Potential Solution	Health Literacy Strategies
Low Vision Patients	High contrast, magnification tools	Difficulty reading, navigating	Large-print materials, high-contrast signage, magnifying devices	Use large-font, high-contrast materials, plain language texts.
Blind Patients	Audio assistance, tactile navigation, accessible technology	Fear of independence loss, accessibility barriers	Braille signs, guide support, mobile apps with voice guidance	Provide audio formats for instructions and guides.
Post-Surgery Patients	Comfortable recovery, clear follow-up instructions	Sensitivity to light, anxiety about recovery	Recovery lounges, soft lighting, follow-up reminders via text	Use visual aids and diagrams to explain recovery steps.
Children	Engaging visuals, child-friendly tools	Short attention span	Play areas, gamified educational materials	Use storytelling and gamified lessons to teach health concepts.
Elderly Patients	Clear instructions, one-on-one counseling	Memory issues, fear of medical procedures	Patient counselors, step-by-step explanations	Provide written and verbal instructions; repeat key points.
Patients with Disabilities	Custom support, accessible facilities	Mobility or cognitive challenges	Ramps, ergonomic seating, staff trained in special needs care	Simplify medical terms; use visual aids and step-by-step guides.
Caregivers	Educational resources, emotional support groups	Lack of knowledge, caregiving stress	Informative brochures, group therapy sessions	Provide FAQs, workshops, and clear, concise guides.
Patients with Language Barriers	Multilingual materials, interpreters	Difficulty understanding instructions	Bilingual staff, multilingual apps	Use translated materials and culturally appropriate visuals.
Rare Condition Patients	Specialized treatment plans, access to experts	Limited awareness, financial strain	Collaboration with specialists, financial aid programs	Offer condition-specific resources in simple language.
Underserved Communities	Affordable care, outreach programs	Financial barriers, lack of proximity to care	Sliding scale fees, mobile clinics	Use visual posters and community outreach to explain services.

Takeaway #2 – Method for improved information clarity can be achieved by developing criterias for both human and non-human agents.

Diction and Phrase Universality

Understandability

Contextual Appropriateness

Alternativeness of Information Delivery

Emotional and Responnsiveness

To address the identified challenges, it is crucial to establish design parameters that prioritize empathy and clarity in patient communication. Recognizing the multifaceted nature of patient personas, especially for low-vision and blind individuals, the design must transcend generic solutions and focus on inclusivity and trust-building.

Key questions to guide this process include: How does the service adapt to diverse sensory and cognitive needs? Does the communication style foster patient confidence and understanding? How are touchpoints evaluated for their ability to convey reliability and credibility?

By systematically answering these questions, the design can be calibrated to not only meet functional needs but also create a positive emotional impact.

This approach ensures that service artifacts are not just tools but facilitators of meaningful, trust-driven patient experiences.

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Diction and Phrase Universality

Understandability

Contextual Appropriateness

Alternativeness of Information Delivery

Emotional and Responnsiveness

• Diction and Phrase Universality

- Is content format intended for a wide arrange of audience members? In the case of specific scenarios, is the terminology unambiguous to the directed audience?
- Does the content assume any prior knowledge in order to be interpreted properly?

• Understandability

- Is content presented in audible volume, visible type size, recognizable speed, easy-to-follow rhythm, and places appropriate pauses for the user to internalize information

• Contextual Appropriateness

- Does the content take into account previous instructions or knowledge? If so,does the user need a reminder?
- Is the tone and manner of the content in a voice that understands the intended audience?

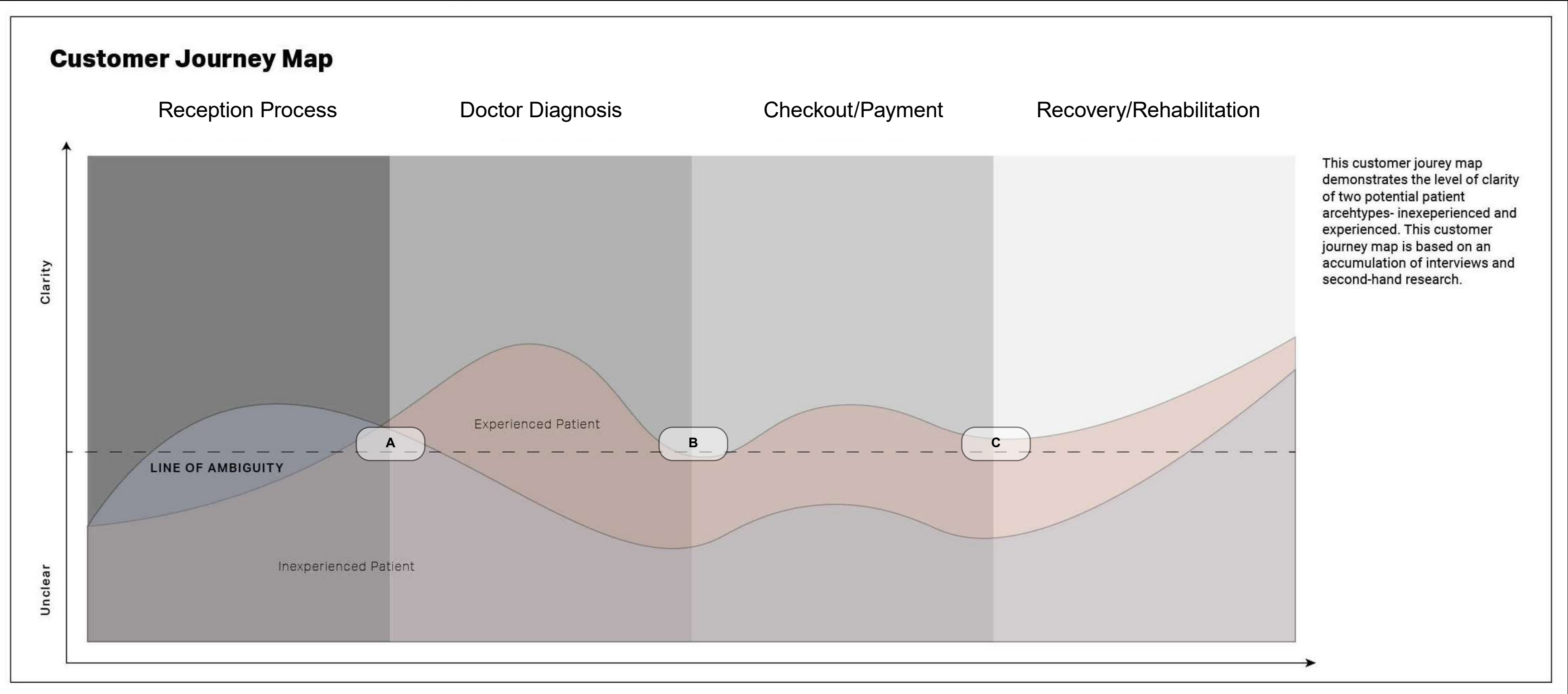
• Alternativeness of Information Delivery

- Is the information absolutely necessary? Is the content informational or overwhelming the listener?
- Is there an alternative to how the content can be delivered so that listeners can sustain other information without interruption?

• Emotional Intelligence and Responnsiveness

- Does the content voice/speaker demonstrate emotional intelligence and humanness?
- Is the medium of the content responsive to questions or alternate scenarios?
- How knowledgeable and aware is the speaker (i.e. Kiosk screen, Doctor, Nurse, Phone operator, etc...) of the patient or other types of listeners?
- Does the medium allow user feedback to reflect change in the future?
- Does it have personality and a personal voice or anthromorphic traits?

Takeaway #3 – A user journey map compiling the experiences of patients reveals where users will likely require assistance and responsiveness to the mediate their discomfort.



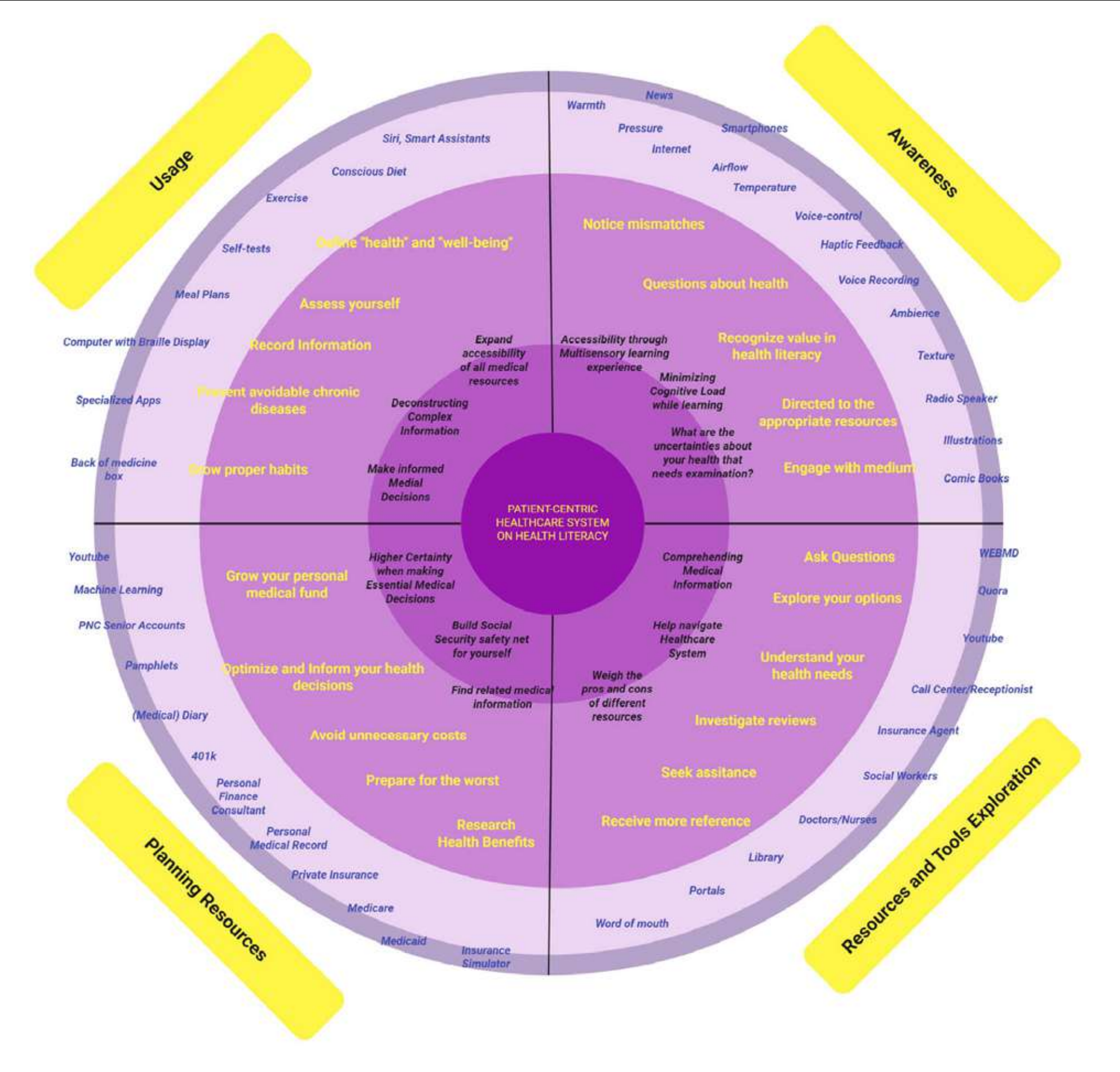
The analysis identifies emotional and logistical challenges in hospitals for both inexperienced and experienced patients. Inexperienced patients often face heightened anxiety during their initial visits due to unfamiliar environments and comprehensive assessments.

To alleviate this, implementing service touchpoints that simplify navigation and provide reassurance can foster a more positive and less overwhelming experience.

Conversely, experienced patients exhibit a dip in certainty during specific phases of the medical process, particularly around waiting times and the checkout procedure. This suggests that their focus shifts toward optimizing efficiency rather than adapting to the environment. Addressing these concerns by streamlining operational processes could significantly enhance their satisfaction.

By leveraging a patient journey map, designers and healthcare providers can better understand these emotional responses and decision-making behaviors. This tool serves as a foundation for creating empathetic, patient-centered solutions that cater to the distinct needs of both inexperienced and experienced patients, ultimately improving the overall quality of care and experience.

Patients often seek for clarity during transitional phases of the journey motivated by personal experience, socio-economic standing, or even by how they feel in the moment.



EMPATHY CARDS FOR NON-BLIND AND NORMAL VISION DESIGNERS

Ruth just recently retired from her 35 years of job at the local elementary school as a math teacher. Two out of three children still need her support. She sometimes keeps secrets away from her husband because financial distress leads to fights.

John was born with a rare genetic symptom that has recently caused his left vision to completely shut down. He's only 18, and there are many ways to partially recover his vision. Since John is still underage, much of the situation is unclear and stressful.

Scarlette is a recent nurse school graduate who will work at the new UPMC vision rehabilitation tower. Nurses have to work with multiple stakeholders, and the physical and emotional toll is not easy to describe. She has too many roles to handle at once.

Xian is the mother of Julia, who is a third year college student suffering a seemingly benign tumor in one of her eyes. Xian, who is not fluent in english, has to rely on Julia and others to figure out what she can do to help her daughter.

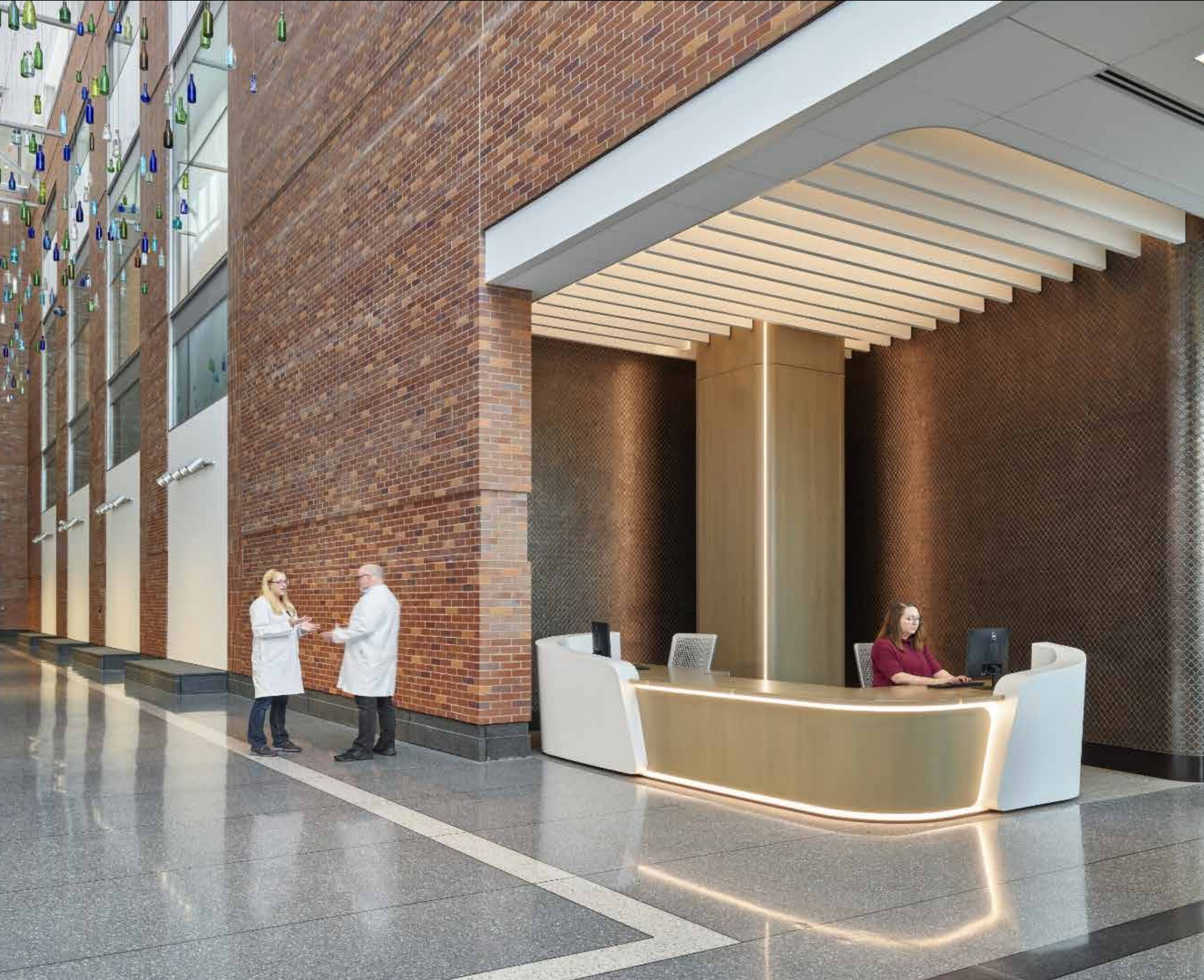
By generating empathy-scenario cards, our group primed ourselves with detailed personas and design scenarios to guide ourselves to work for a more detailed design solution

The hospital environment often places patients in a state of cognitive and emotional overload, where decision-making becomes a daunting task due to limited knowledge, time constraints, and the complexity of medical information. This dynamic underscores the critical role of medical personnel, not only as providers of care but as pivotal figures in guiding patients through their healthcare journeys.

Patient behavior, shaped by varying levels of health literacy, reveals that individuals are active participants rather than passive recipients in the medical process. They continuously engage in a "push and pull" dynamic, seeking clarity, reassurance, and partnership in their treatment plans. This interaction highlights the necessity for healthcare professionals to adapt their communication and support strategies to meet diverse patient needs.

Moreover, the presence of medical staff extends beyond their technical expertise. They serve as anchors of emotional stability, offering implicit assurance through their demeanor and availability. This dual role as caregivers and nurturers reinforces the trust patients place in them, making their influence both clinically and psychologically indispensable.

Ultimately, addressing this interplay between patient behavior and healthcare delivery requires a deeper emphasis on empathy, personalized communication, and education to empower patients while alleviating their decision-making burdens.



Point A - Awaiting Phase

- Waiting area
- Lounges and Sitting Areas
- Lobby Reception Area
- Cafeteria or Retail shops
- Roaming/Wandering

The "Awaiting Phase" highlights the psychological and behavioral dynamics of patients in waiting areas, such as lobbies, lounges, or cafeterias. During this period, patients often experience emotional states like boredom, anticipation, or anxiety, which can lead to behaviors aimed at mitigating the discomfort of waiting. These behaviors may include asking medical staff unnecessary questions or engaging in preparatory tasks like reviewing insurance or payment details.

The text categorizes these interactions as low-commitment "FAQs," suggesting they are easily addressed without significant resource allocation. While digital kiosks or similar technologies could be considered to streamline this phase, their implementation should be justified by offering distinct services or features that address specific needs not met through existing means.

This analysis underscores the importance of understanding patient psychology during the waiting period. By addressing emotional states and providing appropriate outlets for engagement, healthcare facilities can enhance patient satisfaction while minimizing disruptions to staff workflows.



Point B - Processing Stage

- Patient education center
- Browse for a second opinion
- Information retaining
- Emotional processing or acceptance
- Collecting and preparing insurance documents

Based on patient interviews, patients may react with various responses. Some patients may be there for routine check-up, so they would naturally head for checkout. Others might be receiving a life-changing diagnosis.

In order to anticipate and assure patients with varying degrees of support, the hospital should train staff members on where to direct patients whenever asked. The facilities confirmed to be installed at UPMC Vision Institute is holistic and can be effectively leveraged at time like this to help facilitate patient's perception of the medical center as a environment far beyond treatment and diagnosis.

Directing patients to designated departments for patient support also raises information clarity and patient certainty upon receiving counseling.



Point C - Control Stage

The control phase in a patient's health journey is pivotal, as it demands active engagement and accountability. This stage is shaped by numerous factors, including personality traits, emotional resilience, the presence of a support system, and the severity of the medical condition. Patients vary widely in their responses—some exhibit proactive behaviors, while others may feel overwhelmed or emotionally withdrawn.

To navigate this phase effectively, patients should have access to tailored resources that align with their individual needs and preferences. Peer support through group meetings or access to healthcare literature can foster understanding and empowerment, enabling patients to regain a sense of control over their circumstances. However, it is essential that patients are allowed to maintain autonomy in their recovery process.

Hospitals play a critical role by providing tools and resources that facilitate this independence. Structured support, combined with the freedom for patients to chart their own path, creates an environment conducive to recovery. Ultimately, the control phase is about equipping patients with the knowledge and confidence to take ownership of their health while ensuring they are not overly reliant on external interventions. This balance is key to fostering long-term well-being and self-efficacy.