pediatric dialysis

capstone research report

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summary

Children who suffer from chronic kidney failure require the need to receive hemodialysis while they wait for a renal (kidney) transplant. Hemodialysis treatments require children to attend the dialysis unit multiple times per week for long periods of time. Discussed here are the primary research methods used to understand the dialysis experience and the resulting insights and design principles that will be used to inform design decisions moving forward.

In hopes of gaining a better understanding, the team conducted three expert interviews with both dialysis and child experts. Multiple tours of the space, general observations, contextual inquiries with nurses, and patient and parent interviews were conducted. A combination of both drawing and talking activities were used to facilitate conversation with pediatric patients and their caregiver.

From the research, eight key insights were identified. These include: hemodialysis is more than a treatment, patient's history matters, adjustment is ongoing, diet is difficult, relationships require care, patients have preferences, patients want to go beyond distraction, and culture of containment. From these insights, the following six principles were extracted as a standard for future designs. A design must be: safe, non-hindering, adaptable, enriching, enduring, and self-sustaining.

As the team moves into ideation, we will start by exploring four potential areas for intervention recognized during primary research; diet, self expression, education, and social interaction. Throughout the rest of the design process, adherence to the six design principles previously stated is key to maintaining advocacy for the patients while upholding the values and needs of the hospital and its staff.

How might the hemodialysis experience be improved for the children receiving in-hospital treatment?

introduction

“Healthy kidneys clean your blood and remove extra fluid in the form of urine. They also make hormones your body needs for some important functions.” (National Kidney Foundation, 2013). When an individual is diagnosed with end stage renal (kidney) failure, their kidneys no longer function well enough and require treatment to compensate for that lost function. This treatment is called hemodialysis. Hemodialysis helps clean the blood of excess fluids and waste, trying to mimic healthy kidneys. Patients must remain on hemodialysis until they can receive a kidney transplant. The median wait time for an individual’s first kidney transplant in the United States is 3.6 years and can vary depending on health, compatibility and availability of organs (National Kidney Foundation, 2016).

While they wait for a transplant, patients must go to a dialysis center 3-5 times weekly to receive treatment. Depending on the health of the patient, time spent in the dialysis unit varies. An average session is between three and five hours. Children with chronic illness experience a feeling of distance and isolation from their peers and a lost sense of normalcy (Liu et al., 2001) . This time commitment creates time away from home, school, and social life (Maslow et al., 2011) increasing this distance from a “normal life”. Parents also miss significant amounts of work and quality time with their other children while caring for their child with a chronic illness (Heaton et al., 2005).

Our discovery of this problem space was a non-linear journey. It began with the idea of entertainment. In discussing entertainment, we tried to understand why people enjoy entertainment and its purpose. The team settled on the idea that entertainment gives people a way to transport themselves from their current state. The healthcare space was a natural example of a location that would benefit from this transportive quality. Next, we looked at how chronic pediatric patients experience hospitalization and how these qualities could be added. Working with our sponsor we were exposed to the hemodialysis unit and were immediately interested in its complex and unique nature. Our team purposed the question, "How might the hemodialysis experience be improved for the children receiving in-hospital treatment?”.

In exploring the literature related to pediatric care, there was a focus on the technological, environmental and social aspects related to the care received in the hospital. One such example is Zora—a virtual community piloted in a dialysis unit. It was created by MIT Media Lab, in conjunction with Boston Children's Hospital, to allow pediatric patients to explore identity through a virtual avatar. This design provided insight on the different needs of the people involved within a dialysis unit. The nurses wanted Zora to help patients understand their renal disease, while the patients wanted a place to escape from their illness (Bers et al., 2001). It is important to recognize the conflicting priorities of each stakeholder within this space. Virtual spaces are complex systems and take effort to design, implement and maintain.

Great care and thought have been given to understanding how to design in this unique space with children. One must weigh the benefits of research against the drawbacks of taking time and energy away from a sick child (Robertson et al., 2013). In order to maximize engagement of children in the design process, one must also remember the child-development theory to gauge the mental, emotional, and physical capabilities of a child (Giannakos et al., 2013). Some specific methods include: co-creating with children, online research panels, focus groups, and using friendship pairs (Naranjo-Bock, 2011).

The primary research discussed in this report looks to understand the pediatric dialysis unit experience. We hope that our research will generate insights for potential design interventions that will benefit current and future children receiving dialysis.

research questions

What activities do patients engage in during dialysis treatment?

What are both the limitations and encouraged activities for dialysis patients?

What are the patient's attitudes towards dialysis?

Where does dialysis fit into a patient's schedule?

What social interactions do dialysis patients engage in during their treatment?

How does undergoing dialysis affect the self-image and sense of normalcy for patients?

How do patient's attitudes change as they become more experienced with treatments?

methods

To gain answers to our research questions the team set out to find methods that would yield both diverse perspectives and deep understanding of the problem space.

The team focused on two key perspectives; that of the medical staff administering the care and that of the patient and their family. Contextual inquiry and semi-structured interviews were used to gain insights from the medical staff within the unit. For the second group, a modified version of 'draw the experience' was used. The draw and talk activity was used with the patients and their families to understand their view on the experience and externalize them in an approachable form.

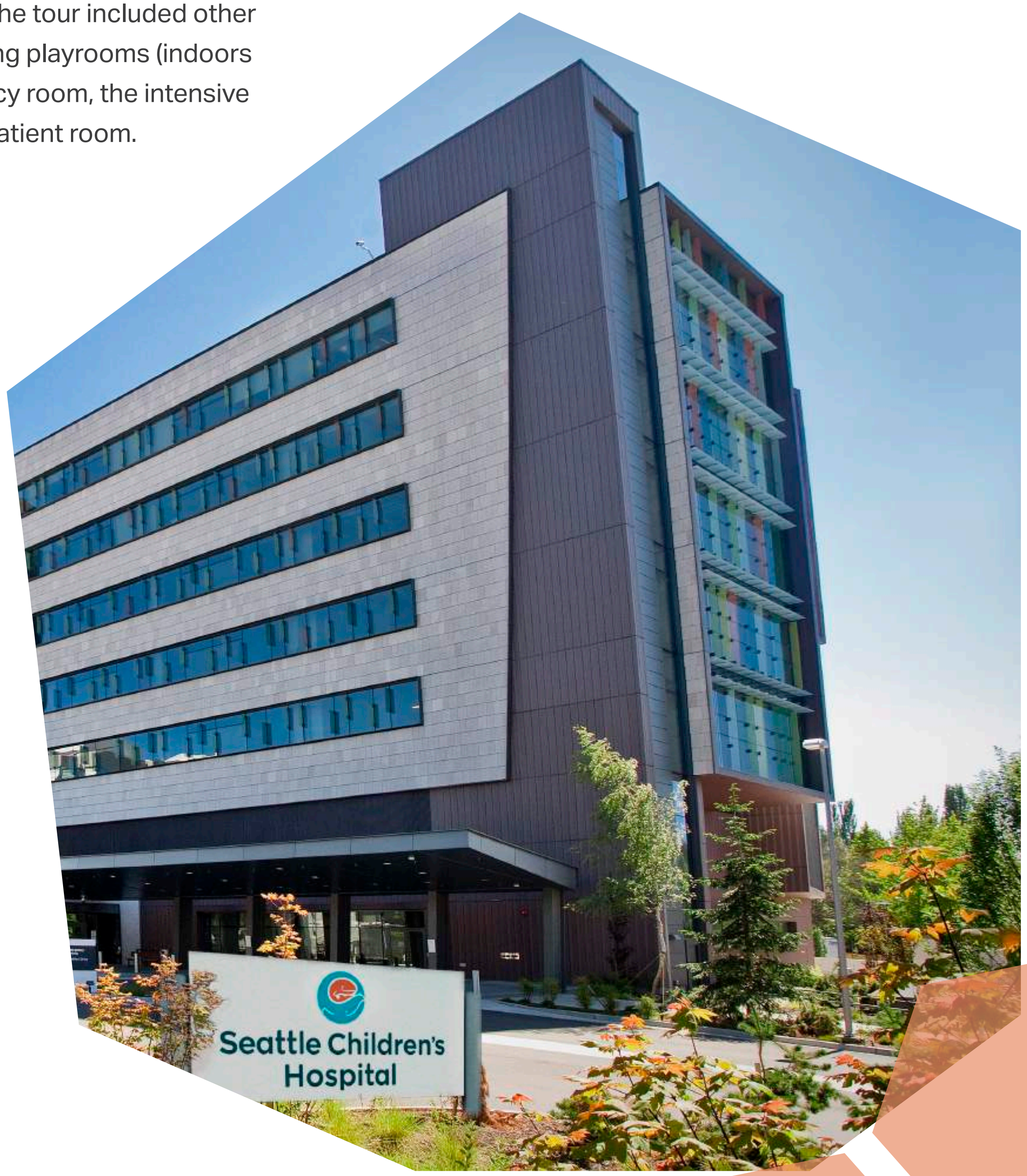
The 'fly on the wall' observation method was used to start the primary research phase, providing foundational understanding and acclimation to the unit. Three expert interviews were held throughout the primary research process.

Recruitment

A letter was distributed to all patients that are currently receiving dialysis treatments at Seattle Children's Hospital. The letter was used as an open call to any individual who would like to participate in the research activity. Due to the limited number of patients in the unit (17), there was no screening based on age, language, or treatment experience. A letter of consent was included for the parent and a letter of assent for the child. Nurses and staff members were selected through unit leadership recommendation. *See Appendix A for Research Kit.*

guided tour

Project Sponsor, Dr. Ari Pollack, gave a tour of multiple locations within Seattle Children's Hospital. It was informal and questions were asked for clarification. Spaces, equipment, and different roles in the hospitals were explained and a detailed tour of the dialysis unit was given. The tour included other areas in the hospital, including playrooms (indoors and outdoors), the emergency room, the intensive care unit, and a standard inpatient room.



fly on the wall

Three observation sessions were completed at the dialysis unit as treatments were being administered. Using Mark Baskinger's AEIOU worksheets as an observation guide, as well as open note taking, the team was spread throughout the unit. Two team members focused on observing an individual patient and taking notes for the length of their treatment. The third team member observed the overall unit during that time. Team member rotated during the day and between each observation session. Photos of the unit were taken at the end of the session when it was empty.

3

Observation Sessions

contextual inquiry

Two team members, interviewer and note taker, followed nurses and staff members through their daily routine to see how they prepare, administer and complete treatment. Four individuals participated in the activity, these included two Staff Nurses, one Certified Nurse Assistant, and one Clinical Nurse Specialist. Two of the nurses had multiple years of experience and two had less than six months. No audio recordings or photographs were taken, due to patient privacy constraints.

While the nurses were performing their normal routines we interjected to ask questions, look for clarification, and had them think-aloud as they performed tasks. We also observed how the nurse interacted with the patients and parents.

4

Medical Staff Members

2

Multi-year Experience

2

Six-months Experience

draw and talk activity

Looking to engage young children in a semi-structured interview seemed like an impossible task and for some participants seemed intimidating. We used drawing as a medium to document their thoughts and make the interview more comfortable for the child. Depending on age, the facilitator tailored the sessions to better accommodate the individual participants. Several versions of the activities were created to help adjust for age.

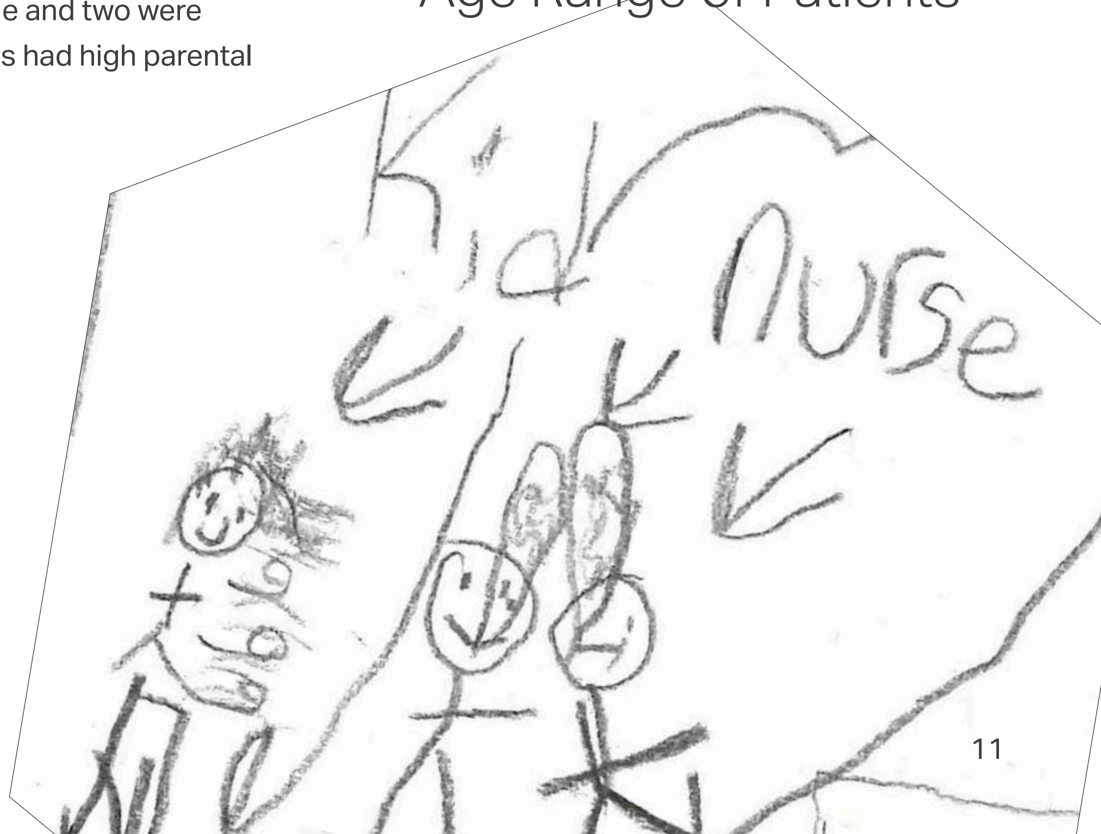
Though drawing was one way for the patient to communicate and externalize thoughts, the participants were also asked to have a conversation. Caregivers or parents were also consulted to answer questions for very young or shy patients. Six participants responded to recruitment, out of those six, four completed the activity and ranged in age from 3-13. Two were female and two were male. Two out of the four sessions had high parental participation.

4

Patient Participants

3-13

Age Range of Patients



expert interviews

Dr. Jason Yip

KidsTeam UW | iSchool

Background

Jason is currently an assistant professor in the iSchool at UW who works with children in co-design environments. Jason Yip is an expert on Digital Youth and has a collection of accepted and recognized CHI papers related to digital youth and co-design. He runs the KidsTeam at University of Washington which is a group of six to ten (7-11 year-old) kids that design technology for kids. This was modeled after work he had done in his doctoral studies at the University of Maryland.

Key Insights

As we engage in design research with children, not only was his knowledge about specific methods insightful but also his knowledge about the organizational and "soft" skills necessary to run a design session. The takeaways were numerous and had a direct impact on our research plans. Building relationships with the children is critical to successful sessions, as well as structured flexibility and contextual considerations. We hope to incorporate participatory design with the patients in our next phase of design.

Helena Hillinga Haas

Art Therapist | Seattle Children's Hospital

Background

Helena is a registered art therapist and licensed mental health counselor in the state of Washington. She received her Master's in Art Therapy from The George Washington University. Helena is an experienced practitioner, having traveled to seven different countries conducting research on "peace and hope" and collecting over 200 drawings on this theme. Currently, she brings her talents as an art therapist to the Seattle area where she runs her own practice and works part time at Seattle Children's Hospital.

Key Insights

Talking with Helena was foundational to understanding the nature of patients in the dialysis unit and how auxiliary departments work with the unit to improve patient care. She had numerous insights into the challenges unique to the dialysis unit and its patients—areas such as privacy, comorbidity, communication, and care constraints. We gained a better understanding of patient moods and their variance, something that we had previously observed but not fully understood. For our primary research we used art as an introductory medium to 'meet patients where they are at'. Moving forward in our design process we hope to incorporate the enriching properties of art therapy like creativity and self expression in some fashion.

Emiliah Kambarami-Sithole, RN

Director of the Dialysis Unit | Seattle Children's Hospital

Background

Emiliah Kambarami-Sithole is the director of the dialysis unit at Seattle Children's Hospital. She has spent the last eleven years directing hemodialysis units. She has a Master's in Healthcare Administration from the University of Phoenix, and is a registered nurse. Kambarami-Sithole's job as director includes both clinical and administrative duties.

Key Insights

As a leader, Emiliah gave us a unique perspective on how dialysis affected the wellbeing of patients and their families and the operational aspects of the unit. She covered the medical educational process for nurses and families and the difficulties that are associated with that process. Mental health of patients and families was also a large topic of conversation. She mentioned there could be more support for parents and how the unit is taking steps to establish a support group for them. She also discussed some of the side effects of dialysis, stressing the effect it has on attention span of the child. Throughout our research, we applied this knowledge in our interactions with patients and parents. Moving forward in our design process we will strive to consider not only the patient's experience, but how the design might impact the operational aspect of the unit.

competitive assessment

Zora is a 3D multi-user computer environment where a user can build a virtual room, fill that room with objects and characters, create an avatar, explore the environment, and converse with other users' avatars. It was created by MIT Media Lab, in conjunction with Boston Children's Hospital and piloted in a dialysis unit. Though we did not have access to Zora, we assessed the system through literature and video demos. Through our assessment we summarized six key takeaways to consider in our future design.

System should be engaging for single and multiplayer use.

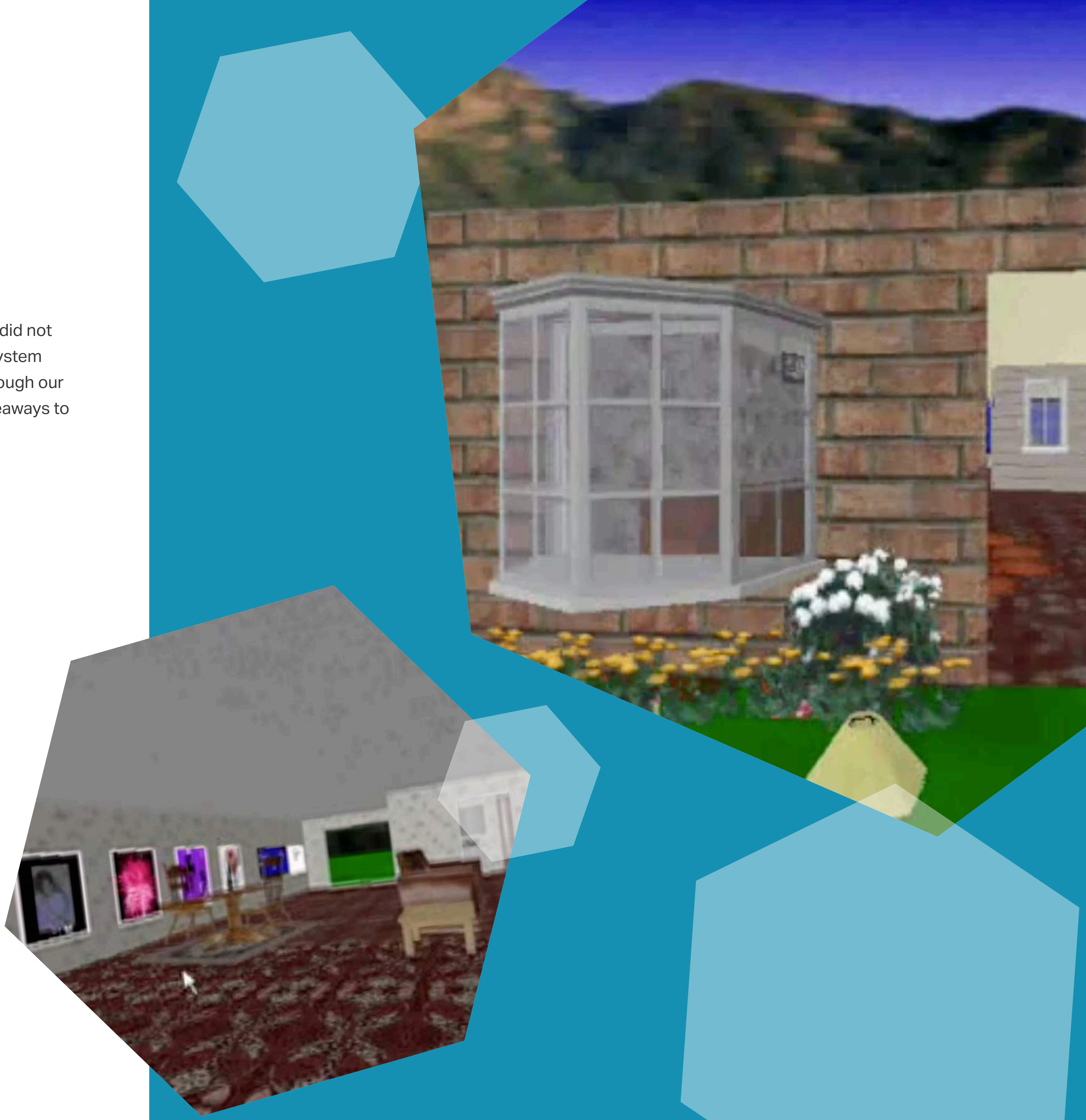
Direct and indirect users of the system have competing agendas, system must accommodate all users.

Accommodate physical state of user (i.e. fatigue, change in medical condition).

Patients want to escape from their current state and express themselves in fantasy, but may want to voice their opinions in a private space.

Both synchronous and asynchronous communication is important for patient interactions.

System should be self sustaining and not require administration from outside parties.



insights

Two data analysis sessions occurred during the primary research process. First, following the completion of the 'fly on the wall' activity. Second, following the completion of our main activities, the contextual inquiry with nurses and the 'draw and talk' activity with patients and parents. Using the 'fly on the wall' data, the team created a relationship diagram using the observation notes. Objects and actors found in the space were documented using photos and sketches.

Affinity diagramming was used to surface themes amongst the data found in the main activities. The insights from the observations and expert interviews were incorporated with these themes to generate the main insights that will be discussed in this section.

Two individuals externalized each of the session notes in parallel to increase diversity and solicit different perspectives on the data. Data was then sorted and organized by the entire team.

Referencing Data

Throughout this section, references will be given to information that comes directly from the data collected. Reference abbreviations are described here:

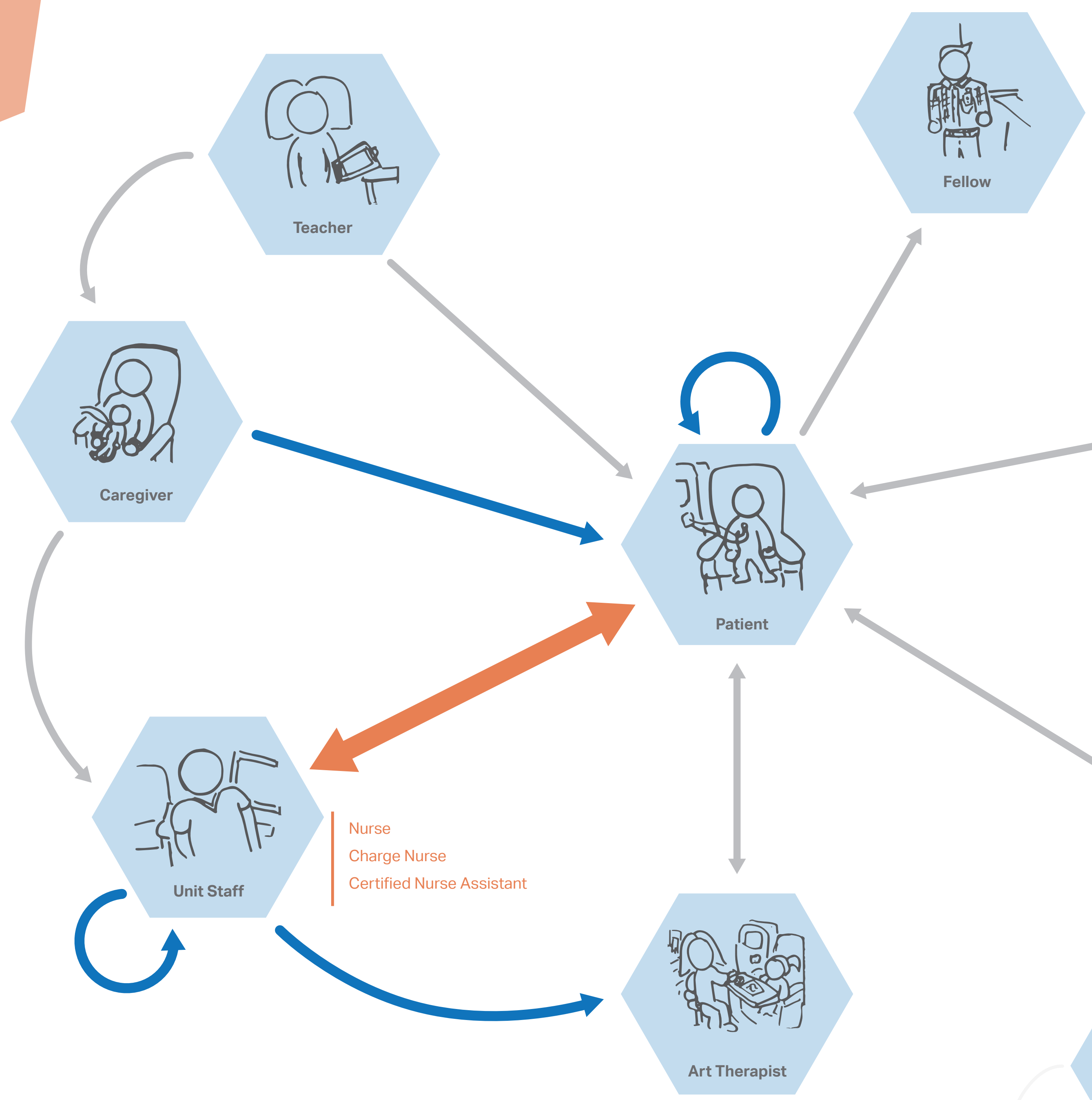
E1 : Dr. Jason Yip, Digital Youth Expert

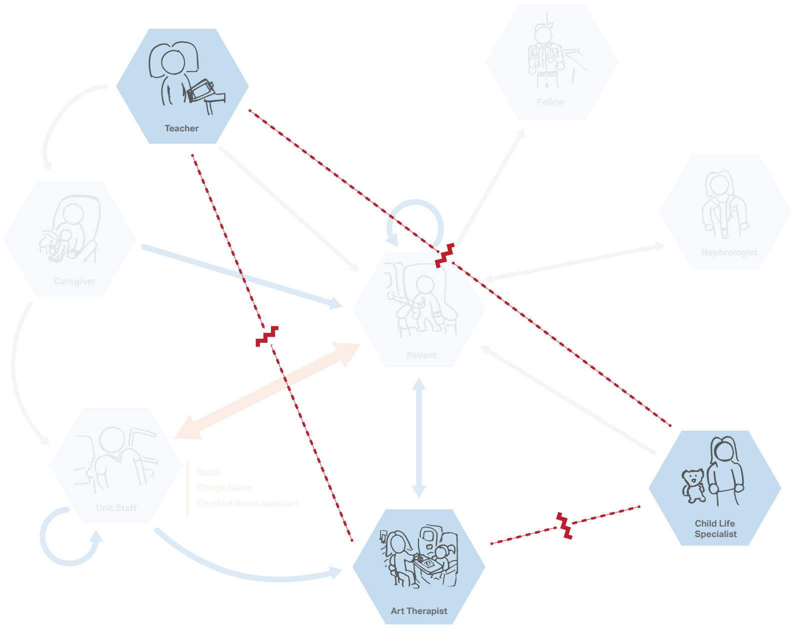
E2 : Helena Hillinga Haas, Art Therapist

E3 : Emiliah Kambarami-Sithole, RN,
Director of Dialysis Unit

P1-4 : Patients

N1-4 : Nurses





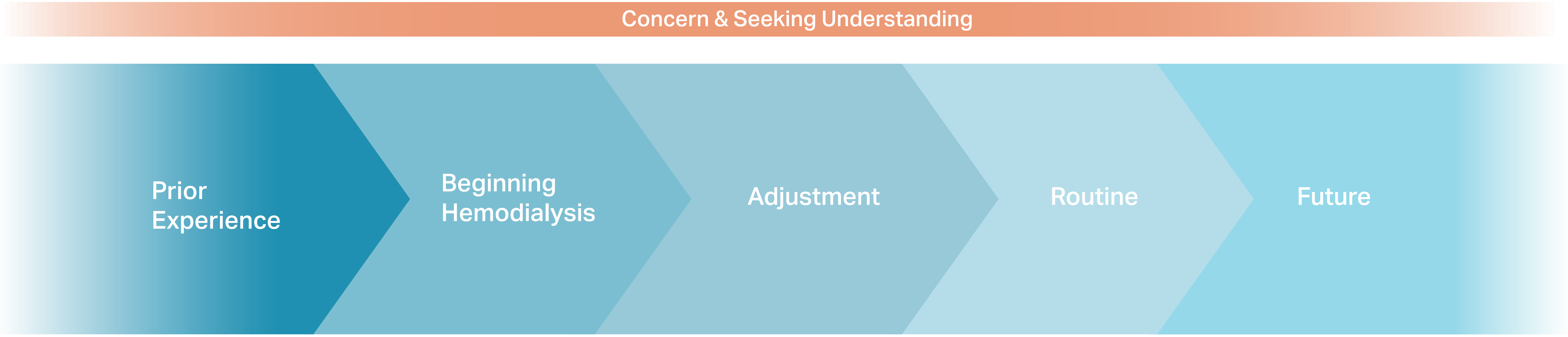
relations & interactions

The results of the 'fly on the wall' sessions led us to consider the actors in this space. Organizing the interactions and relationships observed between the different actors provided some foundational understanding for the team.

The team was not surprised by the patient-centric graph that emerged. It was also clear that the nurses and patients had a very important relationship. The sense of community did, however, surprise the team. We observed patients and parents exchanging greetings and goodbyes.

The relationships that did not exist were of particular interest. One such missing relationship was the lack of interaction between the various auxiliary services (art therapist, child life specialist, teacher). The team used this information to discuss this dynamic with the experts. These relationships were also helpful in sorting the data collected and should be kept in mind during future design phases.

Hemodialysis — A Patient’s Journey



Concern & Seeking Understanding

Prior Experience

Beginning Hemodialysis

Adjustment

Routine

Future

“I was in isolation for a long time. A year and a half.”
- P1

“First week she was sick during treatment. Doctors were still trying to get the medication right.”
- P3, mother

Patients being to open up about their condition, start to feel normal. [N1]

Patient and parent sit together in chair for every treatment. “It’s their special thing.”
- Observation, N3

“I think he will be an engineer like his grandfather.”
- P2, mother

dialysis journey

Looking to better understand the overarching hemodialysis experience, the team used the data from the research activities to craft a narrative. In doing so, we not only realized how unique each of the patients stories are, but how there are common stages all patients face through the process.

The common journey we have outlined here begins with patients coming from a diverse set of experiences. These experiences dictate how patients and families begin the adjustment phase and how comfortable they are with this new setting. When patients begin dialysis, it can be seen as a frightening, complex, and demanding treatment. Through medical education and support, patients and their families start adjusting to dialysis. As time progresses, families establish routines that help make their new lives more manageable and become accustomed to the steps involved in treatment. These routines create a sense of comfort and facilitate an efficient treatment process. With this sense of comfort, each patient looks to the future through a unique lens. While some patients focus on receiving their transplant, others think about life after the transplant.

Having identified these stages, we can use this as a model to more fully understand how our solution will impact the patients and their families through each phase of the journey.

1 more than a treatment

Hemodialysis cannot be considered an event in isolation. Along with treatment itself, the underlying medical condition, in some cases multiple, coincide with a challenging lifestyle that affects the patient and their family.

Every patient is an individual with unique medical and personal needs. Patients come to need dialysis for several reasons, from the effects of chemotherapy *[P4]* to protein disorders *[P3]*. Though all patients have end stage renal failure, other underlying conditions exist and other symptoms arise *[N1]*. Comorbidity is common among patients, resulting in dialysis playing only a part in their overall medical obligations. Patients not only have to commit to 3-5 days of treatment for 3-5 hours, but also attend doctor's visits or receive other treatments for different conditions—all of which parents may need to accompany. Being in the hospital from 7am to 5pm for various appointments was not uncommon for one patient and his/her family *[P1]*. These medical obligations also impact a patient's schooling, with one patient having never attended public school due to their condition and relying on a home tutor *[P4]*. These obligations create a challenging lifestyle that extends outside of receiving hemodialysis.

> *"Dialysis patients have more problems than most patients I see."*
>
> – E2

2 history matters

Previous circumstances impact patient and family perspective on, adjustment to, and adherence to hemodialysis and its accompanying lifestyle.

> *"It's all she has ever known."*
>
> – P3, Mother

> *"I was in isolation for a long time. A year and a half. At dialysis I get to see more people."*
>
> – P1

All patients come from different lifestyles and varying life experiences. Although many patients have been previously hospitalized, their perspective on and adjustment to hemodialysis varies. For example, one patient came from another country to receive treatment. He recounted his father crying tears of joy when they first entered the clean and organized unit *[P2]*. In contrast, another patient feels restricted in the unit, explaining that in a previous chemotherapy unit she was allowed to bring her dog in during treatment, while during hemodialysis she is not *[P4]*.

Patients who receive dialysis later in life feel that their lives are now restricted socially, physically, and emotionally, because they had a "normal" life before entering the unit. They particularly struggle with the required diet due to previous habits and increased independence *[N4]*. Conversely, young patients struggle less with diet because of close parental supervision and ignorance to mainstream diets.

3 ongoing adjustment

The lifestyle that accompanies hemodialysis requires patients and families to make dramatic adjustments. Adjustment is a continuous process that is aided through appropriate levels of medical education and establishment of routines.

> *"It is routine to come here, because I have been doing it so long."*
>
> – P1

> *"[There is a balance of] knowing enough vs. knowing too much."*
>
> – N2

> *"The more you know the less scary it is."*
>
> – P3

Adjusting to hemodialysis can be difficult for patients and families. Many families must move closer to the hospital *[P1, P2]*, other families travel great distances for treatment multiple times a week *[P3, P4]*. Families must uproot their whole lives and adjust to a completely foreign environment for the care of their child. For some parents, dialysis becomes their whole life and working becomes impossible *[P4]*. Siblings are also impacted. One patient has a sibling that spends the entire treatment on their iPad waiting for the treatment to complete *[Observation]*. Hemodialysis is also frightening *[P3]*. This fear can be minimized through time, medical education, and the establishment of routines, but more medical education is not always beneficial. Medical knowledge can become a burden for some patients and families, where knowing too much creates anxiety and makes it harder for nurses and medical staff to administer care *[N2]*.

4 diet is difficult

Despite its indispensable role in proper dialysis care, patients still struggle with diet restrictions and sometimes disregard them. This can have immediate and persistent effects on patient health and wellbeing.

The goal of a single hemodialysis treatment is to remove waste from the blood and meet a target dry weight. During the course of our primary research it became obvious that diet plays a critical role in the health and wellbeing of patients receiving hemodialysis. It was further reaffirmed through secondary research that hemodialysis treatment is more effective and patients feel better when they follow diet recommendations. It was shocking to see the struggle and sometime disregard *[P1]* patients and families expressed in relation to diet.

As we worked with patients, it became clear that diet was not siloed and had several external influences. One influence was age—many older patients find it difficult to adhere to a strict diet as they gain independence. Another influence was family routines and culture. One patient finds it difficult to stay on the required diet at home while her brothers eat a regular diet *[P4]*. Another patient spent an entire session role-playing a restaurant with the research team, placing limitations on the menu that align with what he could and could not eat *[P2]*. This shows how central diet is for patients and the struggles they face.

> *"Food is a huge struggle for patients."*
>
> – N3

> *"A kid needs freedom every now and then."*
>
> – P1

5 caring for relationships

Medical care staff are not treating a disease, but rather a child. Establishing empathetic, yet professional, relationships is critical to providing the level of care expected by the patient and their parents. However, relationships are particularly fragile, requiring effective communication and trust.

During interviews, nurses stressed the importance of building relationships with patients and its positive impact on care. Despite their busy work life, they expressed a desire to spend more time with patients and build relationships. Patients and families also discussed the importance of trust and confidence in the nursing staff.

Nurse management said a tension exists between having close personal relationships and maintaining a sense of professionalism. This can be hard when nurses spend more time with patients and their families, than their own families *[N2]*. Many times the unit was characterized as a family from the people within the unit. One nurse called the dialysis unit a patient's "forever family" *[N3]*. These close relationships between nurse and patient/parent are of the utmost importance, but do not save nurses from continuous scrutiny from parents and patients. To ensure continuous patient trust, nurses do their best to communicate care effectively.

> *"There is an emphasis on building a personal yet professional relation with the patient and their family."*
>
> – N3

> *"Build confidence and take good care of the patient from the start. Relationships can be tarnished very easily."*
>
> – N2

6 patient preferences

Patient individuality has an impact on care preferences. Not being sensitive to these preferences can be detrimental to interpersonal relationships and establish negative emotional associations for the patient.

Ranging from liking Lego *[P1, P2, P4]* to preferring to hook themselves up to the machine *[P4]*, patients have several preferences that deal with not only what they like to do during treatment but how their treatment takes place. These treatment preferences can even include preferences for specific nurses by patients or their parents. It was also observed that parents and patients have rituals that they perform every treatment. For example, one parent holds and sits in the chair with the patient throughout the treatment *[N1]*. Several patients also gravitate to the same stations. In the unit there are several stations, seven in total. These stations are normally assigned to the patients. Although patients have assignments, preferences often override or dictate the assignment. Not following specific preferences can even result in patients having strong emotional reactions making it impossible to administer treatment *[P4]*.

> *"This is her spot, it's familiar and quiet, they tried to move her and treatment was impossible."*
>
> – P4, Mother

> *"The dad prefers certain nurses. I am one of them."*
>
> – N1

7 beyond distraction

Distraction through entertainment is not sustainable, it is shallow and temporary. Patients prefer human interaction and play, over solo play or technological interventions.

Effective distraction for patients during dialysis is desired by nurses as it allows for dialysis to work effectively. The ideal distraction is one that does not block blood lines, keeps a patient's blood pressure within limits, and calms the patient, while still allowing patients to communicate how they feel *[N1, N3, N4]*. Common distractions include hospital-supplied iPads, arts and crafts, reading, cell phones, school work, or rest. Some patients bring items from home *[P1, P3]*, however, families that travel far rely on the hospital playroom or the materials they have in their personal in-unit toy box *[P4]*. These distractions are the current solution, but patients become bored and unfulfilled. Patients and families expressed the need for more entertainment, even though the unit has many of the requested items *[P1, P4]*. We suggest that this furthers our point that the current entertainment is shallow and unsustainable. Patients are also isolated and express the want to interact and play with other people. Patients enjoy interacting with volunteers, play specialists, the art therapist, clowns, and dog therapy *[P2, P4]*. Effective and meaningful distraction continues to be a struggle in the unit.

> *"We like when the art therapist or CLS comes in and visits."*
>
> – P4

> *"I want a volunteer! I want a volunteer!"*
>
> – P2, referring to those who visit the unit to play

> *"You get tired of the iPad, after a while."*
>
> – P4

8 culture of containment

The nature of hemodialysis contributes to a culture of containment—limiting interaction amongst patients and creating restrictions on activities that can be done during treatment. The physical environment where the treatment takes place and the sanitary restrictions critical to maintaining safe care contribute to this culture.

> *"Patients are afraid to open up when doing art. Privacy is one of the biggest differences between dialysis and other patients I visit."*
>
> – E2

> *"I wish I could stand up. I wish I could be more active."*
>
> – P1

The dialysis unit is a constrained environment. The physical space of the unit enforces a culture of isolation from others during treatment. Though chairs for patients are all in one room, patients are far apart making socializing with others difficult. We observed many patients trying to find privacy and many of them use their iPads as their personal space, however this even has its restrictions. The culture of non-privacy creates a strange social dynamic, where children cannot socialize nor escape. However, it is common to see patients make rounds before and after treatment to say hello or goodbye. One patient even arrives early to sit down and play with younger patients *[P4]*. We must be reminded, however, that this is a medical treatment and infection control is critical. Separation is a requirement for sanitation. The machine and treatment itself also adds a layer of constraints, restricting patient movement and activity.

insight summary

1 more than a treatment

Hemodialysis cannot be considered an event in isolation. Along with treatment itself, the underlying medical condition, in some cases multiple, coincide with a challenging lifestyle that affects the patient and their family.

2 history matters

Previous circumstances impact patient and family perspective on, adjustment to, and adherence to hemodialysis and its accompanying lifestyle.

3 ongoing adjustment

The lifestyle that accompanies hemodialysis requires patients and families to make dramatic adjustments. Adjustment is a continuous process that is aided through appropriate levels of medical education and establishment of routines.

4 diet is difficult

Despite its indispensable role in proper dialysis care, patients still struggle with diet restrictions and sometimes disregard them. This can have immediate and persistent effects on patient health and wellbeing.

5 caring for relationships

Medical care staff are not treating a disease, but rather a child. Establishing empathetic yet professional relationships is critical to providing the level of care expected by the patient and their parents. However, relationships are particularly fragile, requiring effective communication and trust.

6 patient preferences

Patient individuality has an impact on care preferences. Not being sensitive to these preferences can be detrimental to interpersonal relationships and establish negative emotional associations for the patient.

7 beyond distraction

Distraction through entertainment is not sustainable, it is shallow and temporary. Patients prefer human interaction and play, over solo play or technological interventions.

8 culture of containment

The nature of hemodialysis contributes to a culture of containment—limiting interaction amongst patients and creating restrictions on activities that can be done during treatment. The physical environment where the treatment takes place and the sanitary restrictions critical to maintaining safe care contribute to this culture.

design principles

adaptable

Designs should be able to adapt to each of the patient’s needs. Patients have differing physical and mental abilities and this should always be at the forefront of the designer’s mind.

enriching

Designs should allow the patient to grow as an individual whether it be intellectually, emotionally, or socially. It is important that the design be enriching for patients and not a shallow distraction.

enduring

Designs should be engaging for the patient throughout their entire dialysis experience. It should become a part of their routine.

safe

Safety is of the utmost importance. All intended users’ safety must be considered at all times. Designs must be conscious of infection control.

non-hindering

Designs should not hinder the operation of the dialysis unit. Nurses, doctors, and visiting services, should be able to successfully complete their duties and administer care.

self-sustaining

Designs should be self-sustaining and minimize maintenance needs. It should limit the need for intervention from outside support. Patients should be able to interact with the design without having to gain access from another individual.

looking forward

As we move into the next design stage, we will begin ideating with the pain points discussed below. While these constitute some of the most prominent topic areas from our research, we will be using them simply as springboards and not design constraints.

We understand the final design may not involve any of these potential topics. A main consideration moving forward will be to balance the needs of pediatric patients with the needs and values of their parents, the hospital, and its staff.

diet

Diet is critical to the success of hemodialysis treatments. Current attempts to teach proper diet and instill adherence are unsuccessful.

social

Patients crave social interactions during their treatments. Designs could allow patients to connect, interact, and play with other patients.

self-expression

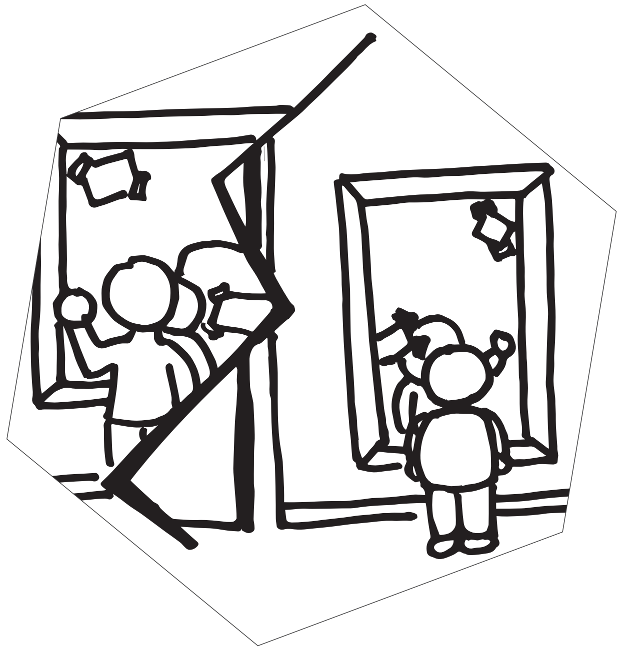
The dialysis unit is a space that lacks privacy and limits expression. It would be beneficial to promote patient individuality and a sense of ownership toward their experience.

medical education

Parents and staff, more than patients, expressed a desire for more medical education. Designs could allow co-learning amongst parents, staff, and patients to better foster understanding of dialysis.

micro-ideas

Taking inspiration from the pain points we identified the team crafted a small set of micro-ideas. These ideas are more about the interesting characteristics the idea embodies and less about the idea itself.



two-way window

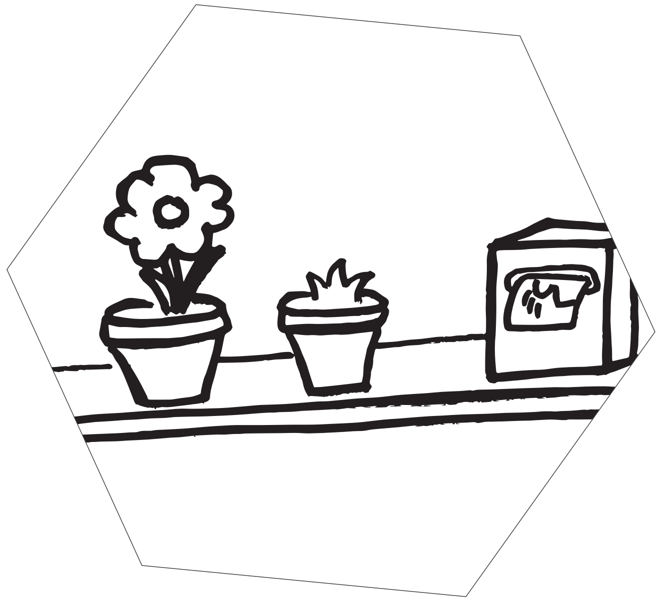
A two way window where patients can watch a live feed of other dialysis units and interact with those patients.

Interesting Characteristics

Social over distance

Communicate with other world - Imagination

Cross-hospital interactions



community activity

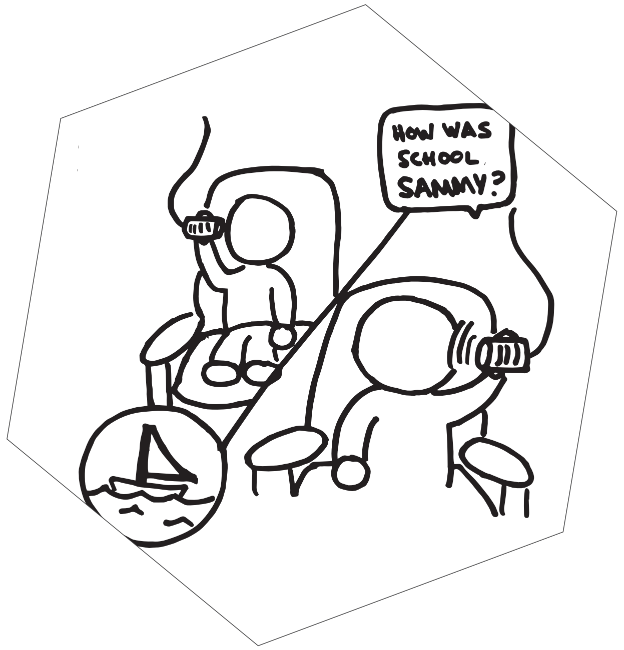
One example might be, patients and families take care of a real garden as a community.

Interesting Characteristics

Common goal, but individual tasks

Routine

Associates something new with dialysis



cans on string

Sharing images and voice messages with others.

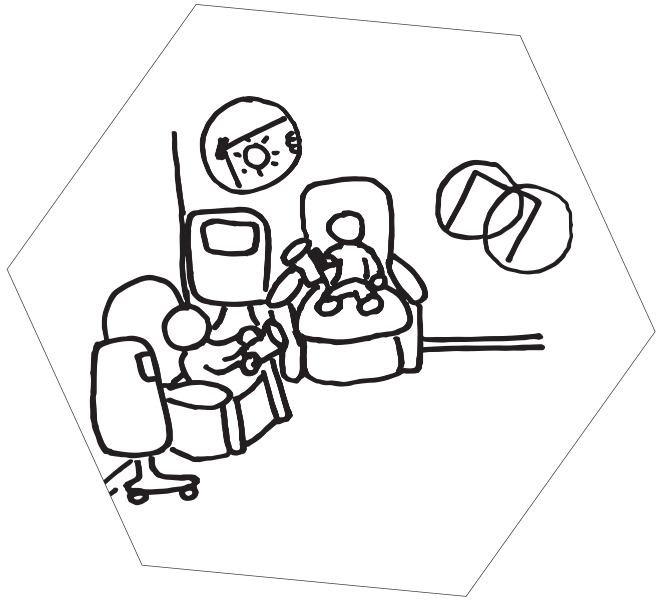
Interesting Characteristics

Hands-on

Synchronous

Social over distance

Identity and expression



spotlight

Hidden virtual objects on the walls of the unit that can be seen by other patients with their flashlight.

Interesting Characteristics

Collaborate in the moment

Increases space

Sense of moving/exploration while seated

shell

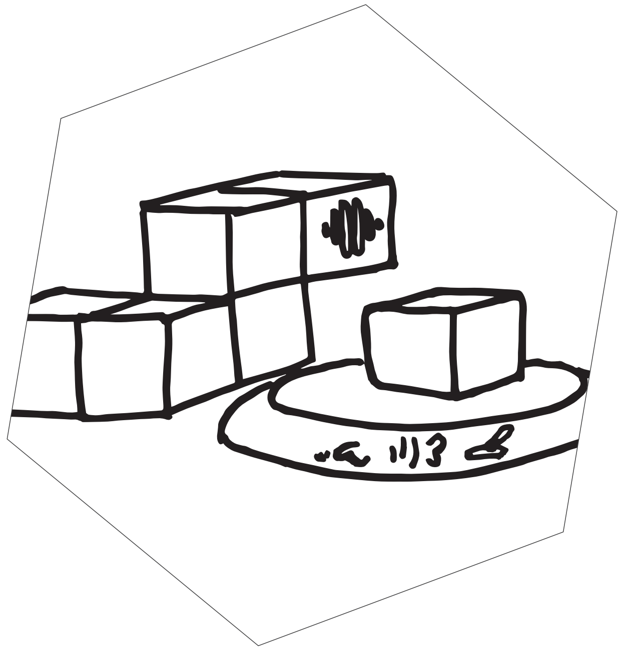
Digital walls surround each dialysis chair so patients can leave virtual objects on their wall and customize their space.

Interesting Characteristics

Self-expression and identity

Sharing

Accommodates multiple patients, while still being personal



cubes

Building blocks that need to be arranged in a specific sequence to hear messages from other patients.

Interesting Characteristics

Self-expression

Building and hands-on

Sharing and collaboration

conversation cards

Cards that allows patients and families to bring up topics that surround chronic illness and treatment.

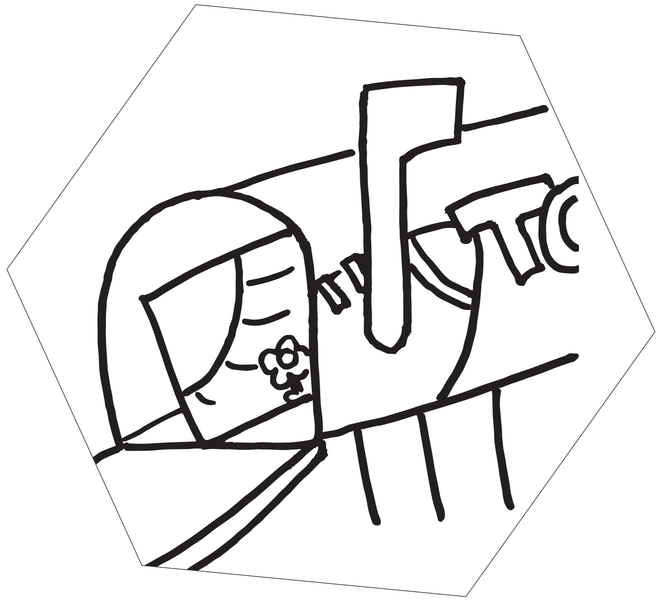
Interesting Characteristics

Help kids communicate, non verbal

Physical and hands-on

Nurse involvement

Patient preferences



mailbox

A physical mailbox where patients leave letters or artwork for other patients.

Interesting Characteristics

Asynchronous

Sharing

Self-expression

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Appendix

Seattle Children's
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MHCI
+D
human-computer
interaction + design

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