ADL 1-2-3 Device: Digital Redesign

Improving patient adherence to infection risk reducing daily activities

Client
Cincinnati Children's Hospital

Duration
6 months

Team
Arel Swift, Communication Design
Kellen Crosby, Biomedical Co-op
Vrinda Trivedi, Design Co-op

My Role
Team Lead
UX + Design Research
Interaction Design

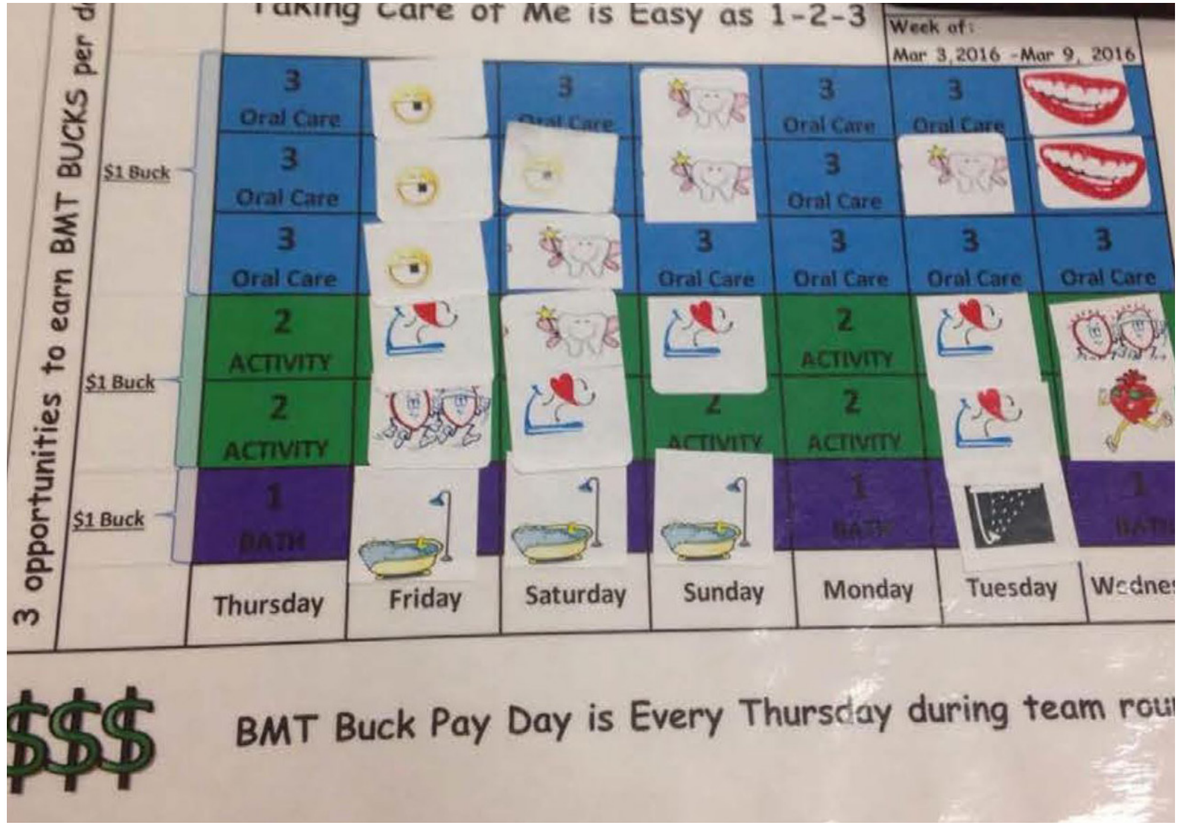
Actions
Formed project goals
Created research plans and guides
Handled client communication
Conducted stakeholder research
Developed personas and journey maps
Analyzed and identified key insights
Produced concepts
Developed wire frames
Constructed high fidelity prototypes
Designed device interaction/UX
Conducted usability testing
Presented to stakeholders and directors

View Prototype

https://projects.invisionapp.com/prototype/123Prototype-ck9isopo8000i8t01q0rk2uqv/play/c62fa6c6

What Is The 1-2-3 Device?

The 1-2-3 initiative was developed in an effort to reduce infection rates and help patients manage their own physical activity and hygiene. This project was founded from a nurse-backed incentivized program that awarded stickers to patients who completed three activities of daily living (ADL's). These ADL's include bathing once, doing physical activity twice, and doing oral care three times hence the naming of the 1-2-3 Device. The 1.0 device was developed to help automate this process for Bone Marrow Transplant (BMT) and Cancer/Blood Disease (CBDI) patients. Patients use the device to log these activities and keep track of points awarded for completion. RFID cards are swiped by patients for logging activities of daily living, and parents and nurses use their RFID cards to verify points.



Original 123 program- Stickers were exchanged for "BMT Bucks" which could be used to buy toys.

The 1.0 device that streamlined the old 123 program.

Project Objective

Cincinnati Children’s was burdened by the upkeep that the physical 1-2-3 device required from stakeholders. We set out to design a program that fosters co-production between all stakeholders that results in improved adherence to infection reducing daily activities for CBDI patients at Cincinnati Children’s Hospital.

Goal 1

Understand deficiencies of the 1.0 device from various stakeholder perspectives (family, staff, patients). Then identify the potential opportunities for device improvement.

Goal 2

Develop a deeper understanding of what motivates patients to increase compliance.

Goal 3

Design a digital version 2.0 with improved interaction, usability, and experience.

Stakeholder Interviews and Observations

We held semi structured interviews with patients and caregivers to gather insights about the current device deficiencies and their needs as users. In the patient/ caregiver interviewee population we had 5 male and 9 female patients. Their ages ranged from 1- 18 (parents were involved in interviewing with younger patients). In the healthcare worker population we had 6 full time nurses. The team conducted observations inside of the hospital as patients, caregivers, and healthcare professionals used the current 123 device. From these interviews and observations the team created task analysis, stake holder maps, personas, and user journey maps.

Topic 1: Understanding

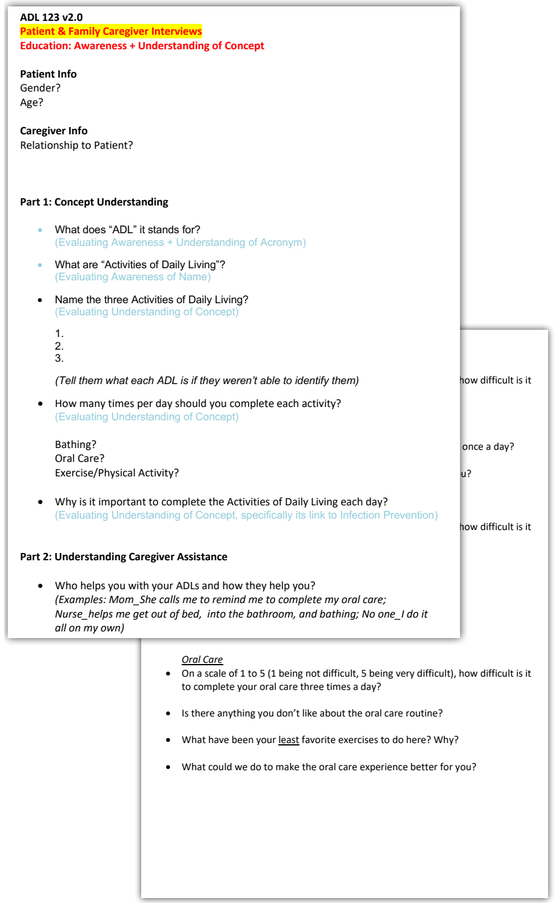
What is the current level of patient awareness and understanding around ADLs?

Topic 2: Caregivers

Who is helping patients complete ADLs?
What are their experiences with ADLs?

Topic 3: Current Experience

How are patients currently handling ADLs?



ADL 123 v2.0
Patient & Family Caregiver Interviews
Education: Awareness + Understanding of Concept

Patient Info
Gender?
Age?

Caregiver Info
Relationship to Patient?

Part 1: Concept Understanding

- What does "ADL" it stands for?
  (Evaluating Awareness + Understanding of Acronym)
- What are "Activities of Daily Living"?
  (Evaluating Awareness of Name)
- Name the three Activities of Daily Living?
  (Evaluating Understanding of Concept)

1.
2.
3.

(Tell them what each ADL is if they weren't able to identify them)

- How many times per day should you complete each activity?
  (Evaluating Understanding of Concept)

Bathing?
Oral Care?
Exercise/Physical Activity?

- Why is it important to complete the Activities of Daily Living each day?
  (Evaluating Understanding of Concept, specifically its link to Infection Prevention)

Part 2: Understanding Caregiver Assistance

- Who helps you with your ADLs and how they help you?
  (Examples: Mom_She calls me to remind me to complete my oral care; Nurse_helps me get out of bed, into the bathroom, and bathing; No one_I do it all on my own)

how difficult is it

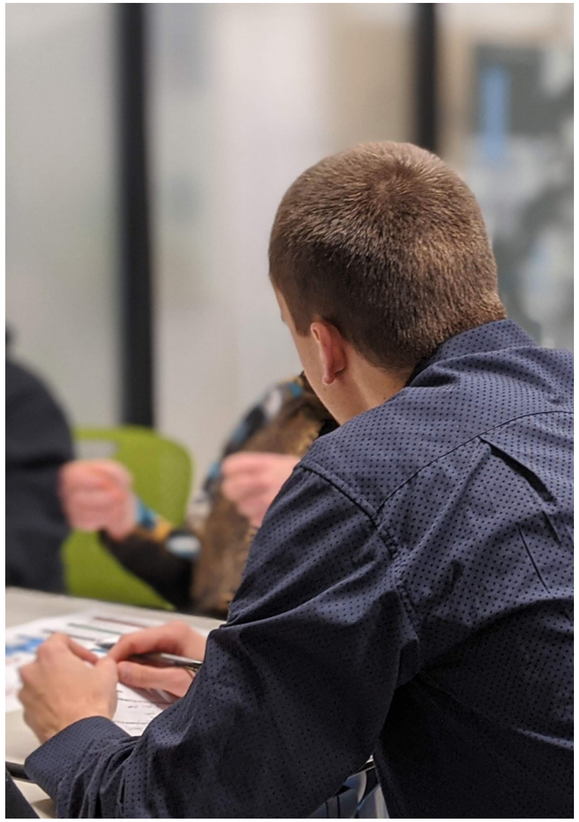
once a day?

u?

how difficult is it

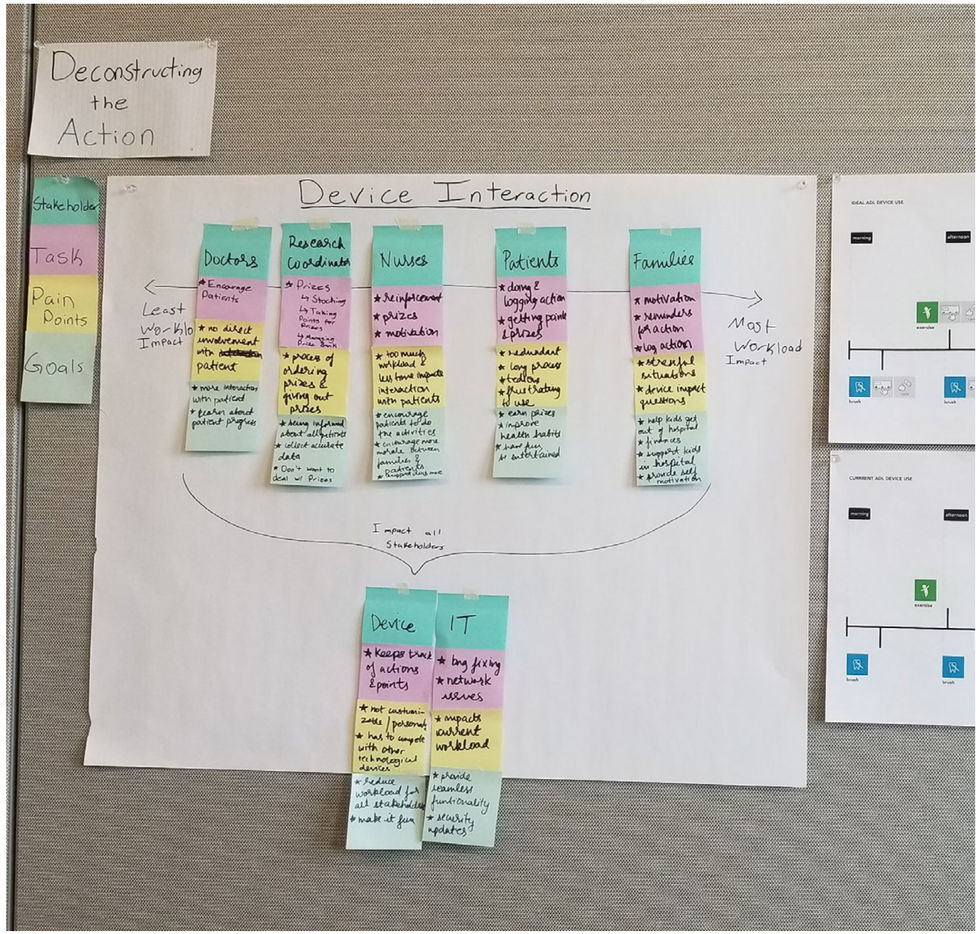
Oral Care

- On a scale of 1 to 5 (1 being not difficult, 5 being very difficult), how difficult is it to complete your oral care three times a day?
- Is there anything you don't like about the oral care routine?
- What have been your least favorite exercises to do here? Why?
- What could we do to make the oral care experience better for you?



1.0 Device Task Assessment

The team observed the use of the 1.0 device with the healthcare staff. This map outlines every daily expected interaction with the 1.0 device as well as the pain points and opportunities areas for improvement. We learned that the 1.0 device requires far too much redundant interaction for nurses and families to maintain, which often left patients waiting for point gratification.



Bathing 1

1. Patient completes bathing activity
2. Patient swipes card over bathing icon to log-in completion of bathing activity
3. Family or Staff swipes card to verify completion of bathing activity

Oral Care 1

4. Patient completes oral care activity
5. Patient swipes card over oral care icon to log-in completion of bathing activity
6. Family or Staff swipes card to verify completion of bathing activity

Physical Activity 1

7. Patient completes physical activity
8. Patient swipes card over oral care icon to log-in completion of bathing activity
9. Family or Staff swipes card to verify completion of bathing activity

Oral Care 2

10. Patient completes oral care activity
11. Patient swipes card over oral care icon to log-in completion of bathing activity
12. Family or Staff swipes card to verify completion of bathing activity

Physical Activity 2

13. Patient completes physical activity
14. Patient swipes card over oral care icon to log-in completion of bathing activity
15. Family or Staff swipes card to verify completion of bathing activity

Oral Care 3

16. Patient completes oral care activity
17. Patient swipes card over oral care icon to log-in completion of bathing activity
18. Family or Staff swipes card to verify completion of bathing activity

- 18 actions per day over the course of a 21 day stay can be tedious
- Person who verifies action must be physically present for verification
- Subsequent completed activities cannot be logged until the prior activity is verified
- Parents often wait to log activities for patients
- Families often wait to log all activities at once

Stakeholder Map

Healthcare providers helped co-create a stakeholder map to better understand the interactions and roles each stakeholder plays during a patient's stay. This process helped the team to better incorporate what type of interactions and needs each stakeholder might expect.

Level 1: Patients

Seeking relief from their physical and emotional symptoms of treatment.

They want to get out of the hospital.

Level 2: Primary Care Team

Interact with many patients on a daily basis.

They care about family adherence and overall patient health.

Level 3: Secondary Care Team

Interacts with patients on a need to need basis.

Level 4: Big Picture Team

Explores how innovation can impact children's as a whole and how it can help other Children's hospitals.

Stakeholder Personas + Archetypes: Caregivers/Guardians

Amanda W

Oliver's Mom

Age: 41 **Occupation:** Financial Administrator (Former) **Primary Language:** English

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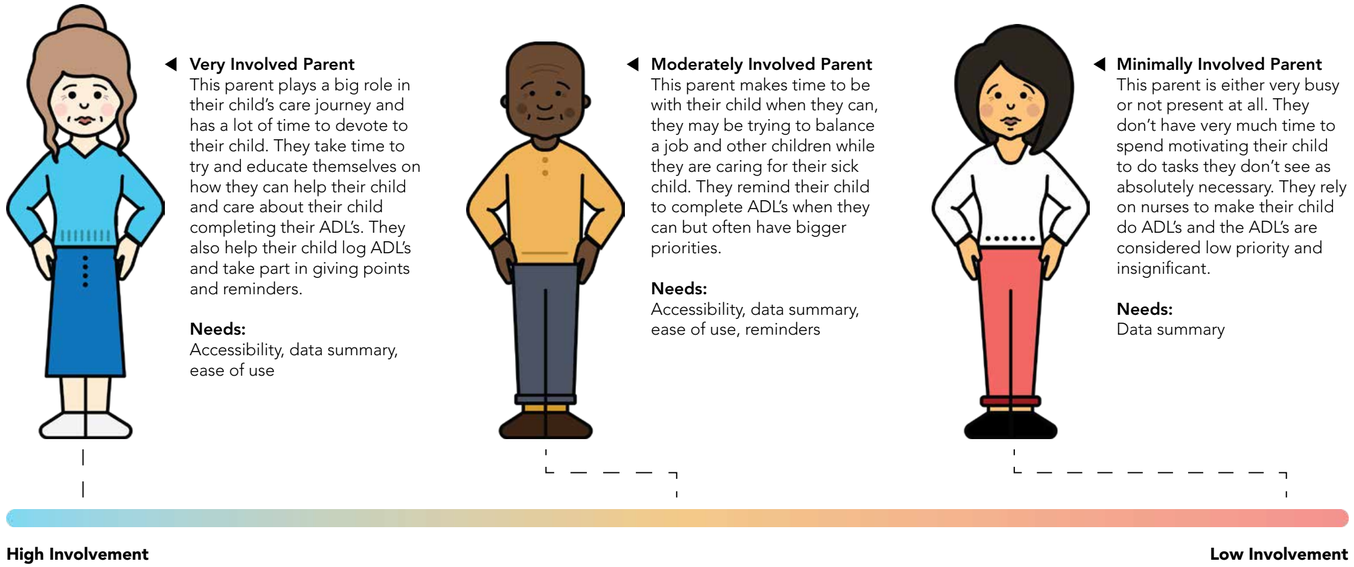
"I'm overwhelmed, worried, and just want to do whatever I can to help my son."

Amanda is Oliver's mom. She's a married mother of three, with her kid's ages ranging from 3 to 9. Amanda was a Financial Administrator at an Optometrist's office prior to Oliver's diagnosis. She's since quit and now splits her time between managing Oliver's medical care and caring for her other two children. Amanda tries to spend as much time as she can with Oliver at the hospital, so that he doesn't feel totally alone, and so she can feel like she knows what is going on with his care. She feels conflicted when she has to leave him, worried that he'll need her support, but she also realizes her other two children need her attention too. **Amanda wishes she could stay on top of Oliver's ADL progress and offer him encouragement — even if she (reluctantly) needs to be away from his hospital room to take care of his siblings.**



Stakeholder Personas + Archetypes: Healthcare Staff

Alex C

Floor Nurse

Age: 27 **Occupation:** Registered Nurse (RN) **Primary Language:** English

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"I am so busy. It feels like there are not enough hours in the day to give quality care."

Alex is Oliver's floor nurse on the BMT unit. Her days all seem like a blur and she's struggling to keep up with everything. While she understands the importance of ADLs she finds it hard to keep track of what activities each of her patients have completed. **She wishes that there was a tool that could help her keep track of her patients' progress without adding too much to her workload. It would also be great if she could customize it to her patient's condition and use it to facilitate conversations with her patients and/or their family caregivers about ADLs.**

◀ High Bandwidth Nurse

This nurse most likely works at Liberty and has a relatively smooth workflow. They have more time to have conversation and interactions with patients and families and are able to take the time to adapt the 1.0 device to their personal needs and patient needs.

Needs:
Accessibility, data summary, ease of use

◀ Low Bandwidth Nurse

This nurse most likely nurse works at MAIN and is busy with little to no time to meet with patients. They have a hectic work flow and are assigned 10-11 patients for their 12 hour shift. They are often pulled aside to help out other nurses and are constantly moving and adapting to a rapidly changing situation due to higher severity cases. They do not have time to facilitate device installation, use, and prize pool.

Needs:
Accessibility, data summary, ease of use

High Bandwidth **Low Bandwidth**

Stakeholder Personas + Archetypes: Patients

Oliver W

Bone Marrow Transplant Patient

Age: 9 **Grade:** 3rd **Primary Language:** English

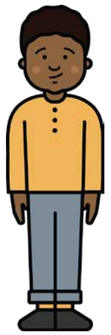
"I just want to get out of the hospital as soon as possible so I can hang out with my friends."

Oliver W. is a bone marrow transplant patient at Cincinnati Children's Hospital. For the past several months he has been impatient undergoing intensive therapy. Like most kids his age, he's considered a "digital native" — he can't remember a time when technology wasn't a part of his life. As a result he's generally unintimidated it. In fact, in an effort to stay as up-to-date as possible with his third grade classmates while he's undergoing therapy, Oliver's teacher is able to nurture and monitor his progress in both Reading and Math using the applications Epic! and Prodigy. Both of these application's have made his learning more fun, making it seem less like work and more like he's playing a game. And when he's feeling less motivated to do schoolwork, these application's help him remain engaged and accountable, since his progress updates are shared with his parents and teacher. **Oliver wishes that doing his ADLs could be more fun, like doing his Reading and Math homework.**

Very Compliant Patient

This patient is excited by device, likes idea of turning points to prizes, and is motivated by prizes (extrinsic). They follows directions and easily completes tasks

Needs:
Accessibility, customization, entertainment



Moderately Compliant Patient

This patient may express some interest but are not overly eager. They do ADL's because they want to, not because they are told to, and are more interested in using device for care journey independence and human interaction.

Needs:
Accessibility, coaching, data summary

Minimally Compliant Patient

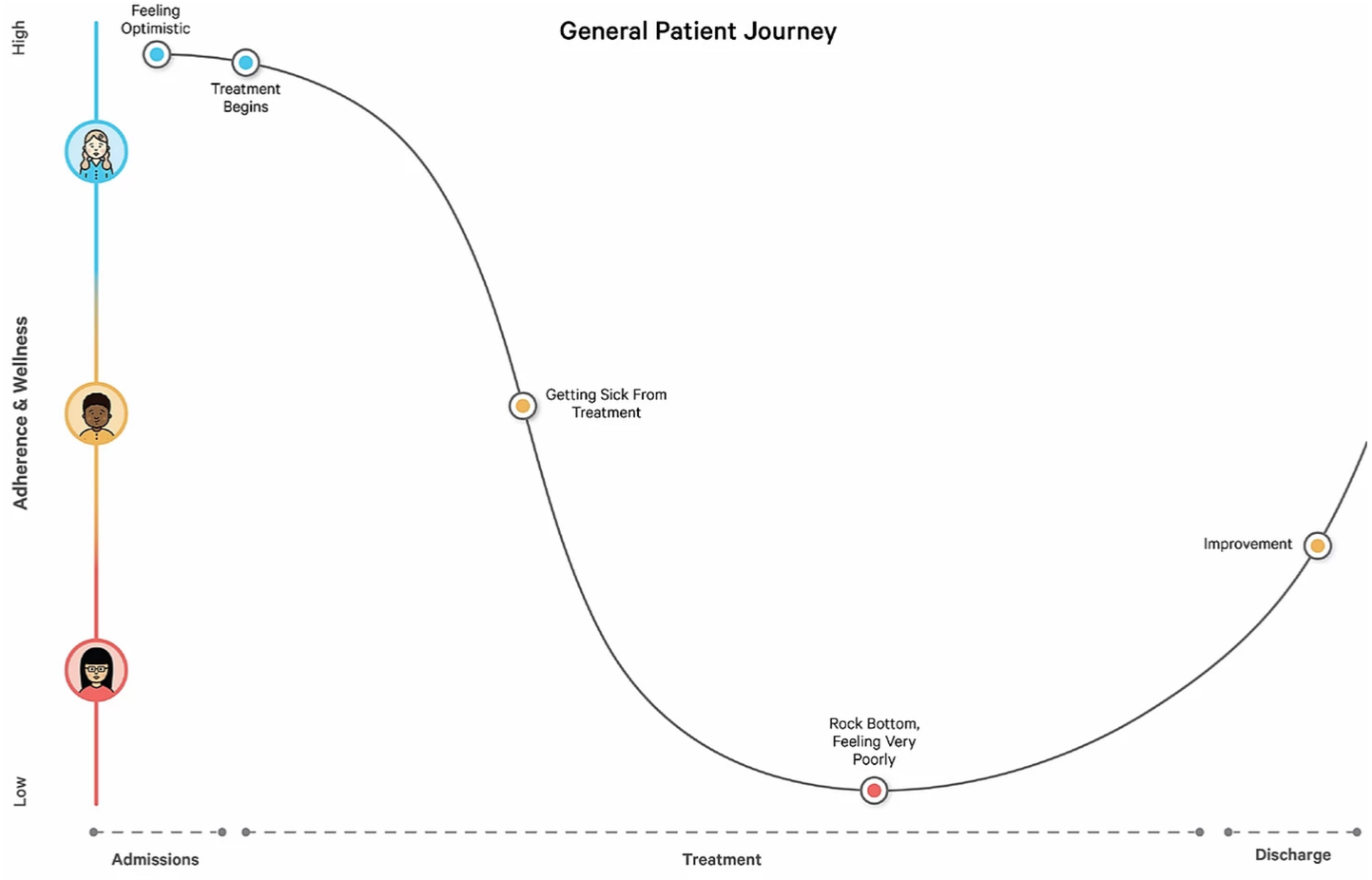
This patient has little to no interest in device and is either too sick or feel they are too old to use it. They do not like being told what to do and make their own decisions and like to be left alone.

Needs:
Accessibility, data summary

High Compliance **Low Compliance**

Patient Wellness Journey Map

The journey map guides a general expectation for how patients can change in persona and adherence based off of where they are in their cancer journey. Patients are still generally very adherent in the early phases of their health journey, but once they feel the negative side effects of treatment, they become less adherent.

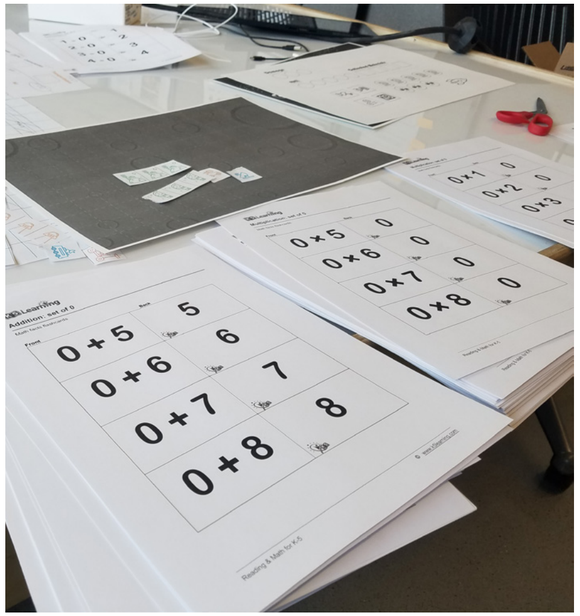


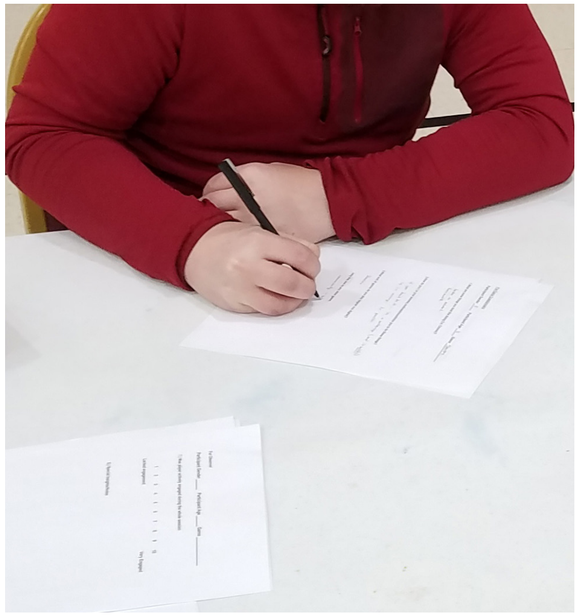
Key Takeaways

- Patients know they have to do their ADLs, but due to their physical wellness, they are sometimes unable to.
- Between week 2 and 3, patients are at their lowest wellness
- Patients sometimes sleep 20 hours extra a day after treatment
- BMT goes through one round of the treatment. Oncology goes through several rounds of treatment.

Youth Patient Motivation

Getting insights from youth patients during interviews is generally difficult. Getting them to elaborate on topics that even adults struggle with, such as personal motivation, is even harder. To gather these motivational insights, we created game based interview tools to frame discussion.





User Population

Total Participants: 12

Age Range: 8-12

Sex: 5 Males
10 Females

Controls

Theme: Space

Concept Medium: Board Game

Task: Math Flashcards

Variables

Game elements
(ex: Competition, Collecting, etc.)

Evaluation Tools

General Motivation Questionnaire

“In-game” observation

Post game exit interview

Case Study 1: Storm Escape

Storm Escape encompassed the game elements of **competition**, and **time pressure**. In this game, the players goal is to get off the planet before the incoming storm reaches their rocket. Every ten seconds, The storm cloud advances one space closer to the rocket. Players have to answer math flash cards correctly to advance their astronaut.

Insight 1: **Time pressure can add positive urgency to task completion.**

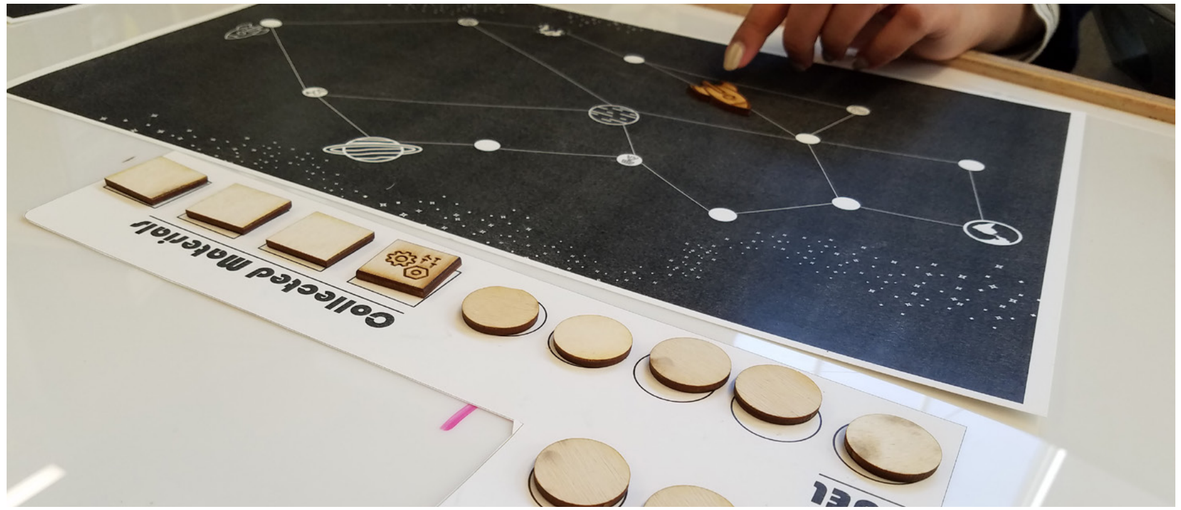
Most players of storm escape had high energy as the seconds ticked away. At first glance this was interpreted as stress but after post game interviews, everyone thought it made playing much more fun.

Insight 2: **Balance of short term engagement vs steady long term play**

Storm Escape was very engaging for players when they sat down to play. However, after several rounds the excitement began wearing off due to repetition.

Case Study 2: Space Rescue

Space Rescue used the game elements of **story, choice, and strategy**. The players needed to save a fellow astronaut stranded in space. However, there were side goals along the way. Players answered math questions correctly to gain fuel tokens. These tokens would allow them to traverse the non linear game board. As they progressed they were given story driven choices to decide how they wanted to play.



Insight 1: **Structured rules were more fun than freedom**

The players left wanting to play again when the game was played with more structure rather than letting them approach it with open ended choices.

Insight 2: **Some control was important to the players**

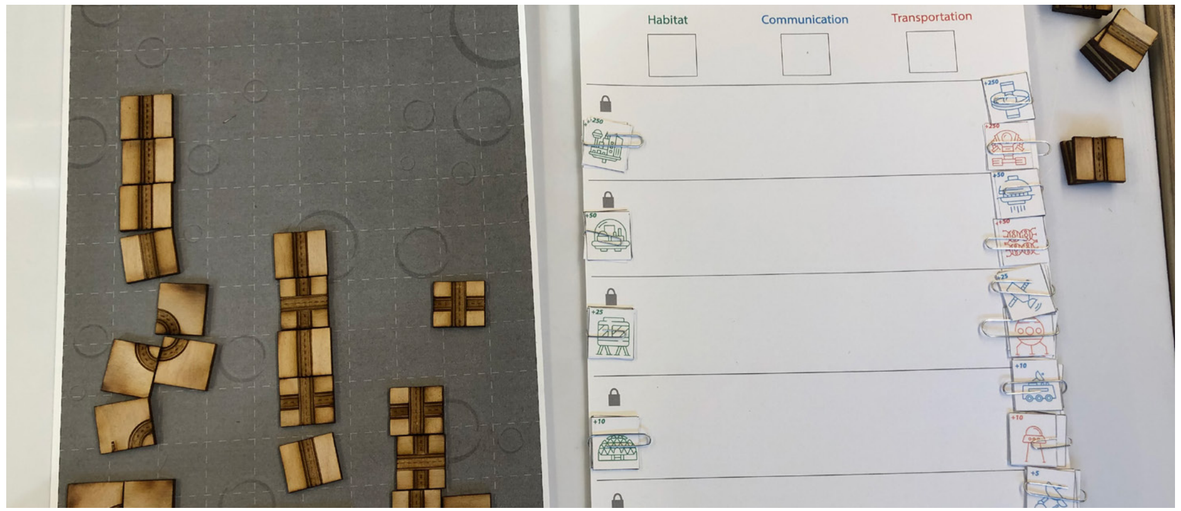
Within the structured parts of the game, it was still important for the kids to have a level of control.

Insight 3: **Consequence increased personal investment into the activity**

Players seemed more engaged when we were actively assessing the choices made

Case Study 3: Moon Base Builder

Moon Base Builder uses game elements such as **virtual economy, growth, and personalization**. The goal is to get a high score by building the ultimate moon base. Correct answers to math flashcards earn virtual currency for base components. These components score them points in different categories. To unlock higher tiers of components and follow the placement rules of the game board.



Insight 1: **Predicting player intention in a customizable system is difficult**

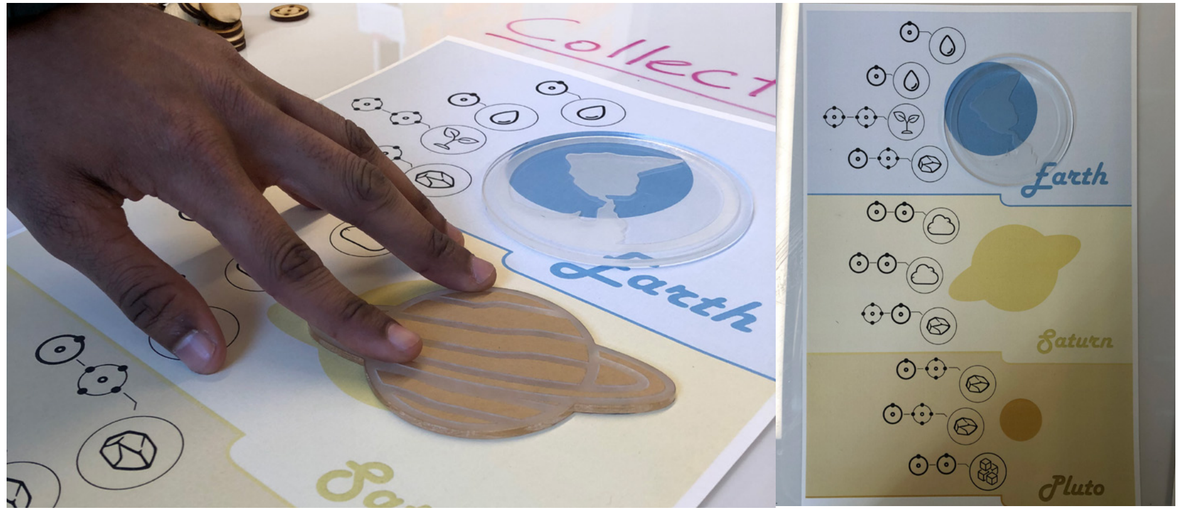
Personalization/Customization is a familiar concept for this age range. Every single user had a very unique way of building their moon base.

Insight 2: **The users want to know their actions make an impact on the system.**

Fully automating some of the game actions led to less engagement from the player.

Case Study 4: Planet Collector

Planet Collector incorporated **collection and badging** as game elements. In this game the players goal was to collect all of the planets. To do this they had to acquire the elements that make up that planet. As they answered the math questions, players had to choose how they were using their earned elements.



Insight 1: **Visual progress is a positive motivator for continued interest**

As players went through the game they kept referring back to where they were in the badging process. Getting confirmation on their intentions.

Insight 2: **There is more prolonged engagement when more game elements are combined**

Players quickly grasped single element games and needed more challenge to engage with us.

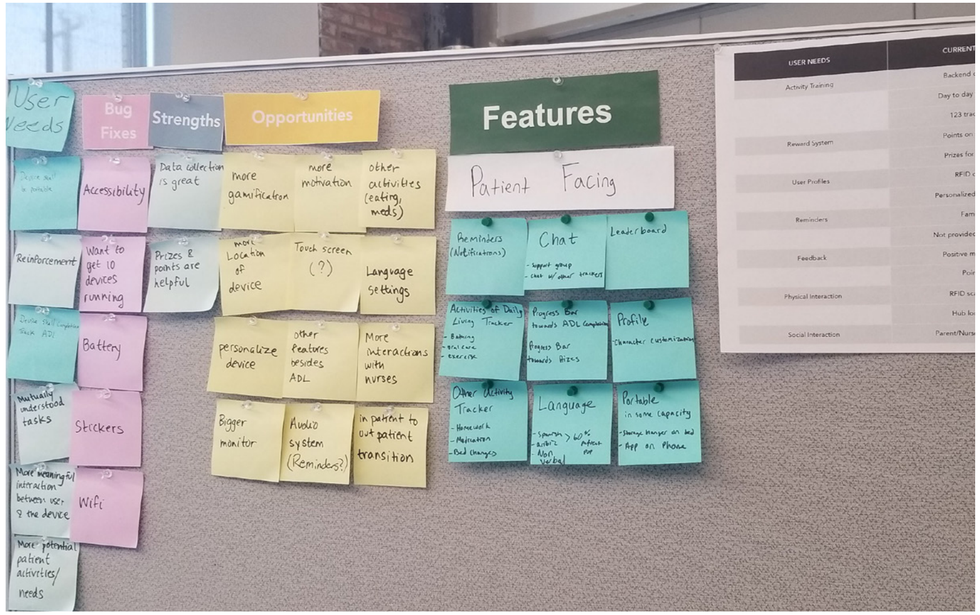
Major Design Criteria

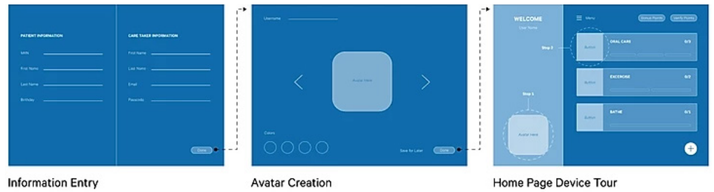
While the 1.0 device improved on overall patient adherence, it was difficult and time consuming for nurses to manage, lacked a deeper sense of patient motivation, was difficult to upkeep, and required more advanced functionality and hardware. Based on the research phase, the team identified criteria goals for the 2.0 device that were laking or not present in the 1.0 device.

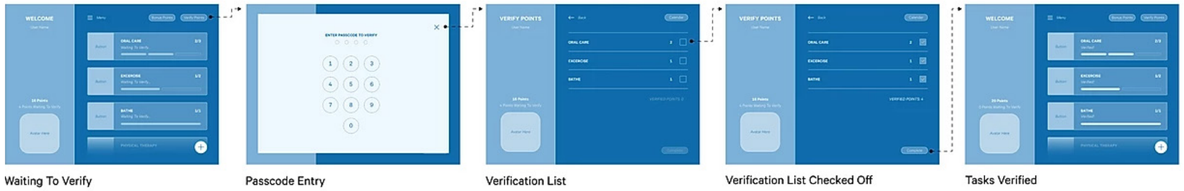
Task Entry	The ability to intuitively and easily track a task corresponding to a certain ADL. The 1.0 device was cumbersome to use for patients and families to use. Task tracking needs minimal barriers for patients to want to use it multiple times a day.
Editing/Customization	Patients have very personal care plans that may change on a moments notice. Nurses need the ability to customize each patients daily/weekly needs if they foresee a barrier in completing ADLs for that patient.
Data Summary/Shared Decisions	The system needs to encourage interactions between the patient and care team, as well as providing actionable data to help facilitate decisions. Parents and nursing staff are concerned with overall patient performance rather than the day-to-day.
Patient Incentivization/Motivation	Provide intrinsic incentivization to encourage patient participation and reduce workload/cost for current staff. Learning curves must be balanced for ideal engagement. Patients need visual representation of growth and improvement for feedback. It is important for patients to know their actions have an affect on an overall system.

Ideation and Wireframing

With the criteria defined, the team developed concept prototypes to gather passive feedback from stakeholders. We wanted to use these to determine strengths and weaknesses to guide next steps. Wire frames of major features were built for each concept.

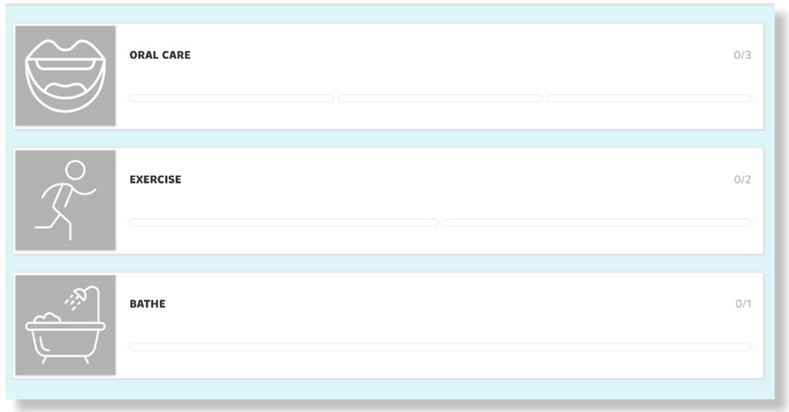


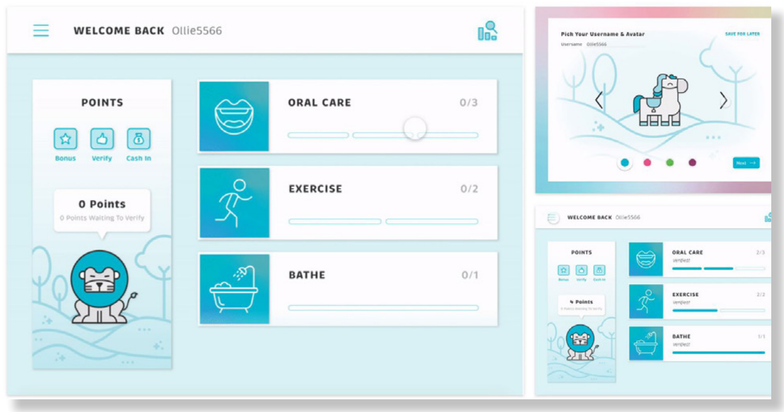


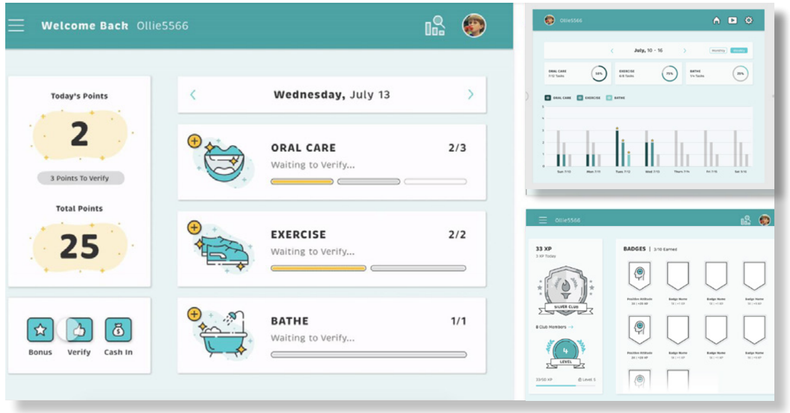


Concept Feedback Testing

We created a rough paper deck of different concepts for users to interact with. This lead to much more engaging conversation about the concepts rather than jumping to digital prototypes. Users were much less afraid to voice changes and opinions. Each concept was improved and influenced by the previous.







Draft 1: Task Tracking

5 users

Concept 1 acted as a baseline concept to build from. It incorporated the basic iterations of logging the ADL tasks. Users were asked about different methods of task tracking and what felt natural. From here we determined a card based system for each ADL. Users “clicked” a specific ADL card to track one task being completed.

Draft 2: Introduction to motivation

6 users

The goal going into the second draft was to refine the less intuitive interactions and begin incorporating patient motivation. An avatar concept was originally proposed by nurses so it was well received when testing with staff; however when testing with older patients (teens), they felt it was too childish for them. While younger children would use the avatar, we didn’t want to alienate older patients who could benefit from the device. This topic needed much more thought.

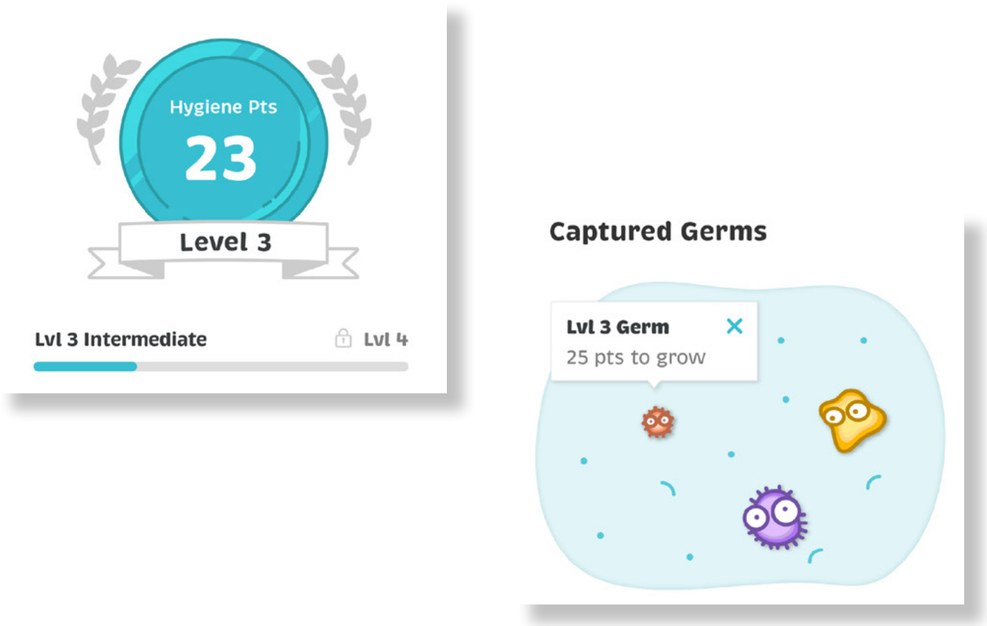
Draft 3: Age inclusion

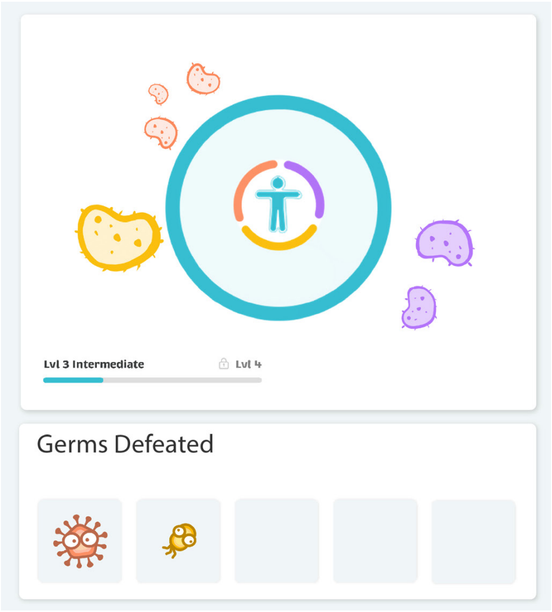
10 users

The third draft UI was far better received by a wider range of ages. While overall usability was successful, there was a disconnect for the patient as to WHY they were doing the ADLs. Users became disinterested in the app as they continued to use it. We needed to find a way to intrinsically motivate the patients and remind them of the overall goal.

Ideating a Better Motivation System

The original solutions for intrinsic motivation was not working in the initial concepts. The team had to rethink their approach. The system needed an obvious way to remind everyone why they are tracking these tasks everyday. Ultimately, ADLs needed to be a story.





Protagonist (Hero):
Immune System

Protagonist (Sidekick):
ADLs

Antagonist:
Germs

Germ Capture Concept

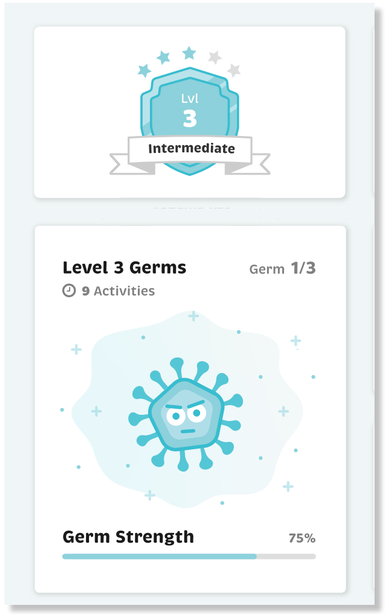
The germ capture concept was about collecting germs over time. The player gained points as they completed adls. This , in turn, earned them germs. The game mechanics of this solution seemed feasible and the learning curve was easy. However, the overall execution did not convey the right information about ADLs. It seemed like doing ADLs added to a more infection prone environment. This was not the message we wanted to send.

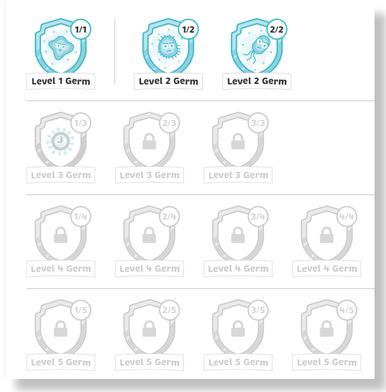
Immune System Defense Concept

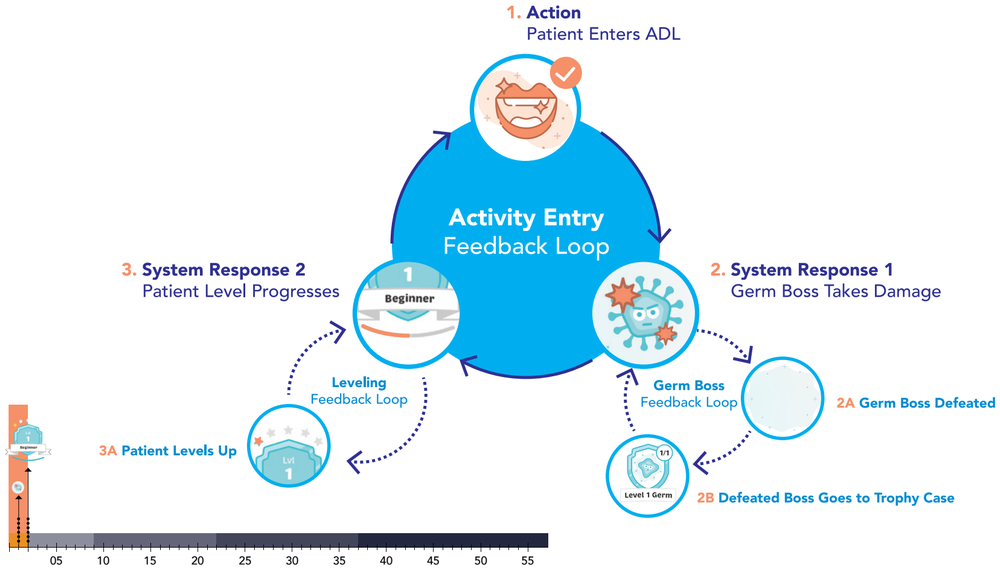
The idea behind immune system defense was keeping your digital self healthy and infection free. Your immune system is the protagonist fighting off the enemy, GERMS! Germs can shrink your immune system. Luckily, completing your ADL's helps destroy germs which earn points to upgrade your immune defenses. The overall message of this system was great, but the learning curve was a bit to high to understand. We needed to find a solution that took the best of both concepts.

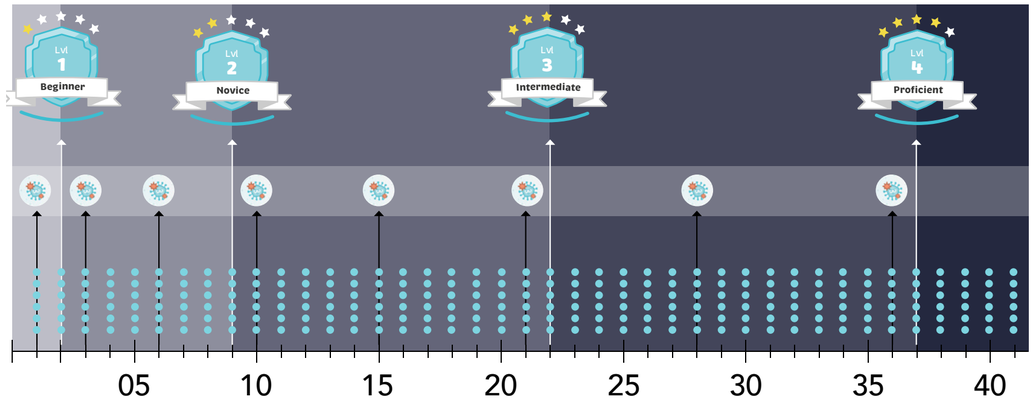
Defeat The Germ Concept

The germ defeat concept solved what the previous two solutions were missing. It combined the educational story line of immune system vs. infection, but included an appropriate learning curve. Players are completing ADL tasks to defeat the germs and keep their immune system strong. Users complete an ADL which then weakens a germ and adds points to their immune system level. Once a germ is defeated it is added to the patients trophy case. The system uses a scalable staggered positive reinforcement strategy. This strategy keeps the users engaged early on and grows with them to prolong interest.









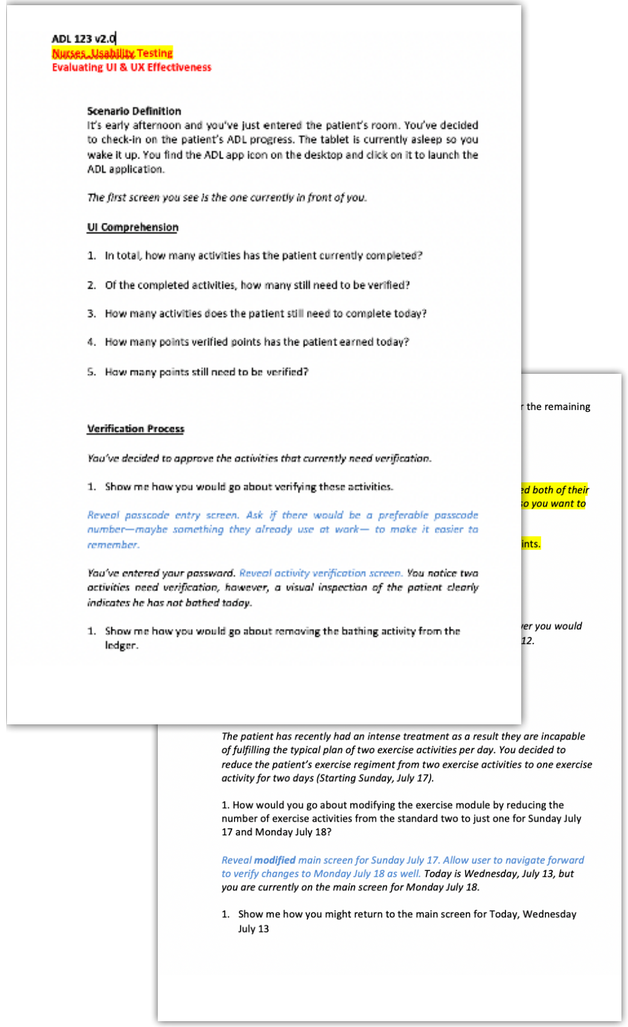
Completed = 3 micro animations

Germ destroyed

Immune defense level increase

Usability Testing: Paper Prototype

A paper prototype of the updated design was built to test usability. Test subjects included 4 nurses and 4 patients. They were provided with different scenarios to comprehend the user interface for the main architecture topics of activity entry, incentivization, system editing, and data analysis.



ADL 123 v2.0
Nurses_Usability Testing
Evaluating UI & UX Effectiveness

Scenario Definition
It's early afternoon and you've just entered the patient's room. You've decided to check-in on the patient's ADL progress. The tablet is currently asleep so you wake it up. You find the ADL app icon on the desktop and click on it to launch the ADL application.

The first screen you see is the one currently in front of you.

UI Comprehension

1. In total, how many activities has the patient currently completed?
2. Of the completed activities, how many still need to be verified?
3. How many activities does the patient still need to complete today?
4. How many points verified points has the patient earned today?
5. How many points still need to be verified?

Verification Process

You've decided to approve the activities that currently need verification.

1. Show me how you would go about verifying these activities.

Reveal passcode entry screen. Ask if there would be a preferable passcode number—maybe something they already use at work— to make it easier to remember.

You've entered your password. Reveal activity verification screen. You notice two activities need verification, however, a visual inspection of the patient clearly indicates he has not bathed today.

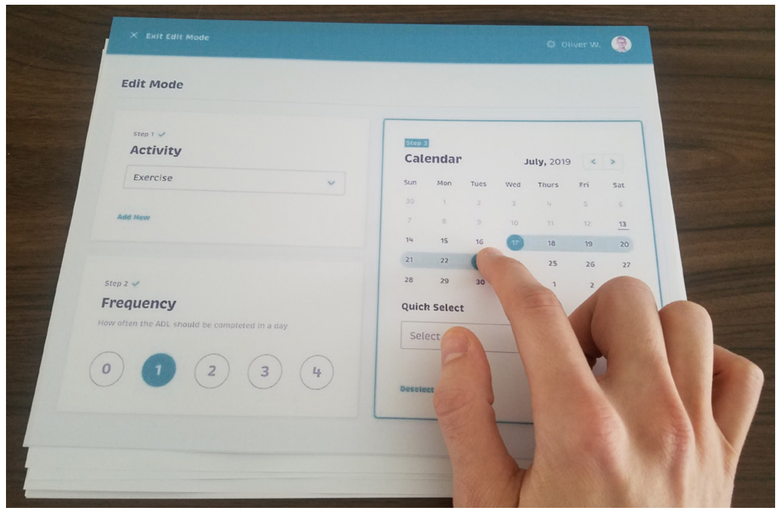
1. Show me how you would go about removing the bathing activity from the ledger.

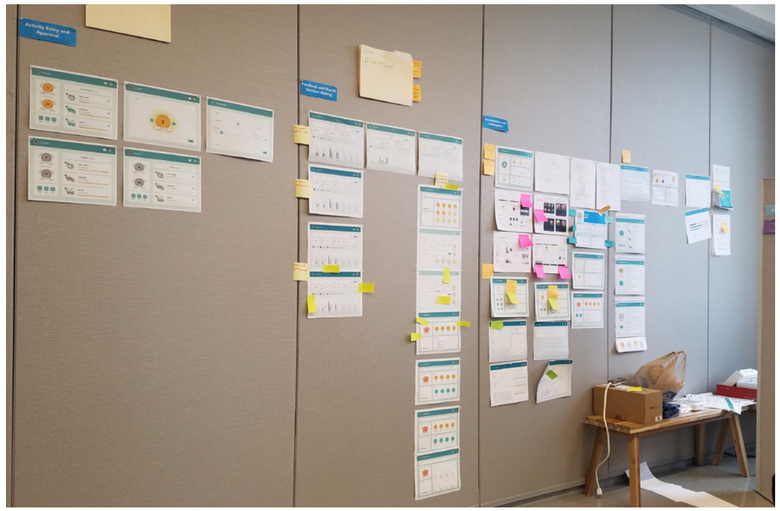
The patient has recently had an intense treatment as a result they are incapable of fulfilling the typical plan of two exercise activities per day. You decided to reduce the patient's exercise regiment from two exercise activities to one exercise activity for two days (Starting Sunday, July 17).

1. How would you go about modifying the exercise module by reducing the number of exercise activities from the standard two to just one for Sunday July 17 and Monday July 18?

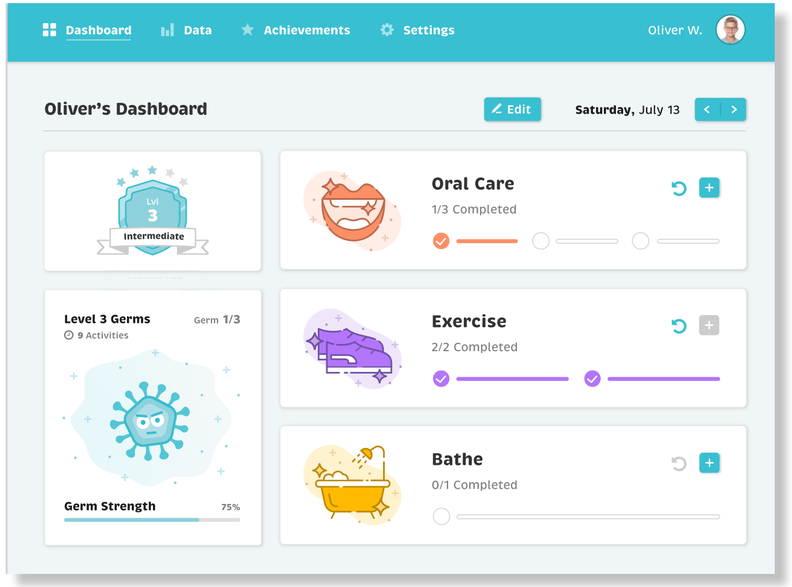
*Reveal **modified** main screen for Sunday July 17. Allow user to navigate forward to verify changes to Monday July 18 as well. Today is Wednesday, July 13, but you are currently on the main screen for Monday July 18.*

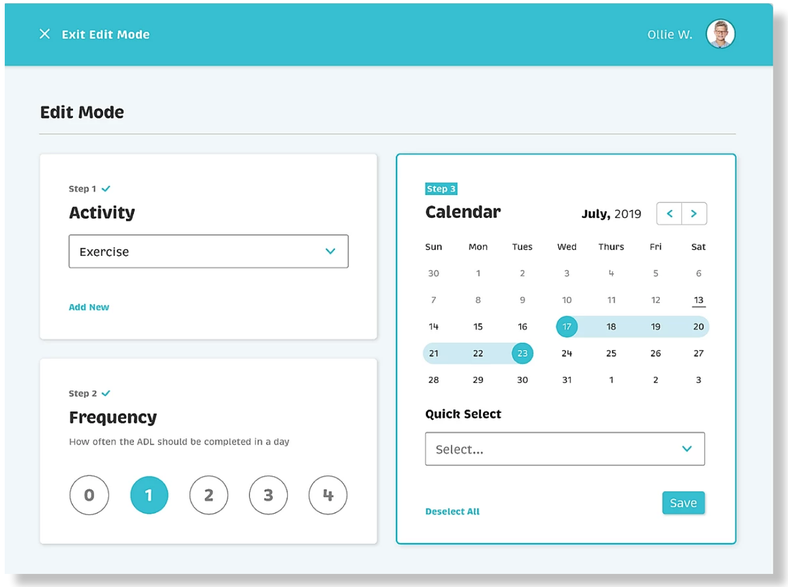
1. Show me how you might return to the main screen for Today, Wednesday July 13

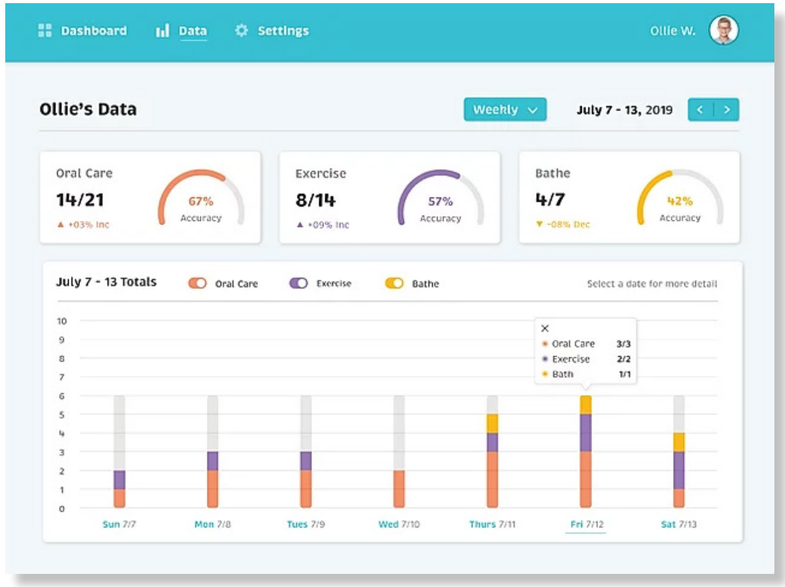




Testing Updates







Final Evolution: Activity Entry/Incentivization

Task entry was cut down from a 3 step to a 1 step process. Removal of the verification step made the activity entry process more intuitive. The incentivzation system was familiar yet interesting to the patients. We added micro animations and staggered positive reinforcement to make task tracking give immediate feedback.

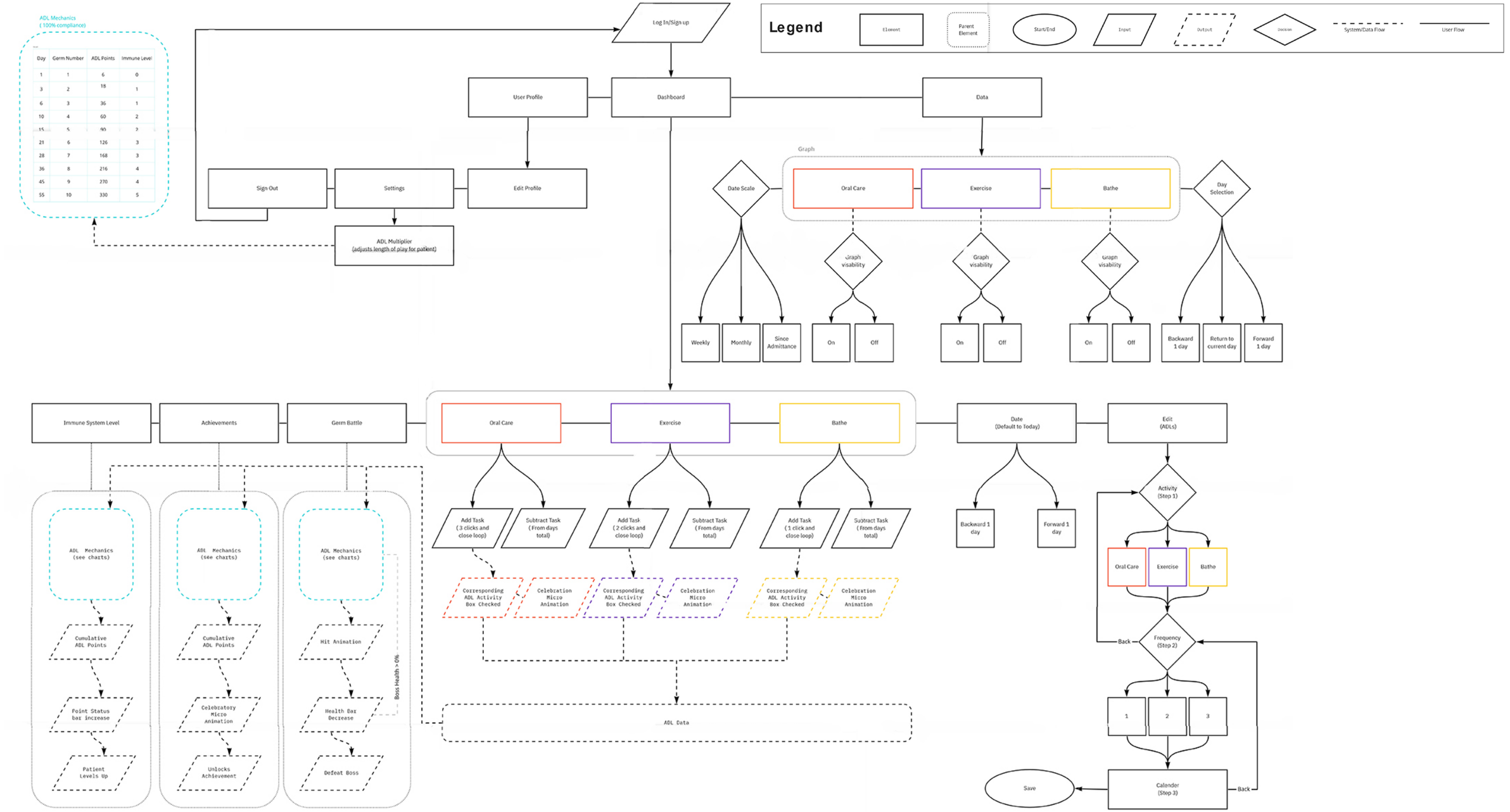
Final Evolution: Editing

Editing of ADL tasks allowed for more customization in regards to fluctuating patient needs within their journey. These needs change often as patients may have unforeseen challenges with their treatment program. Nurses commented that the stepped process was intuitive and easy to use.

Final Evolution: Data Summary

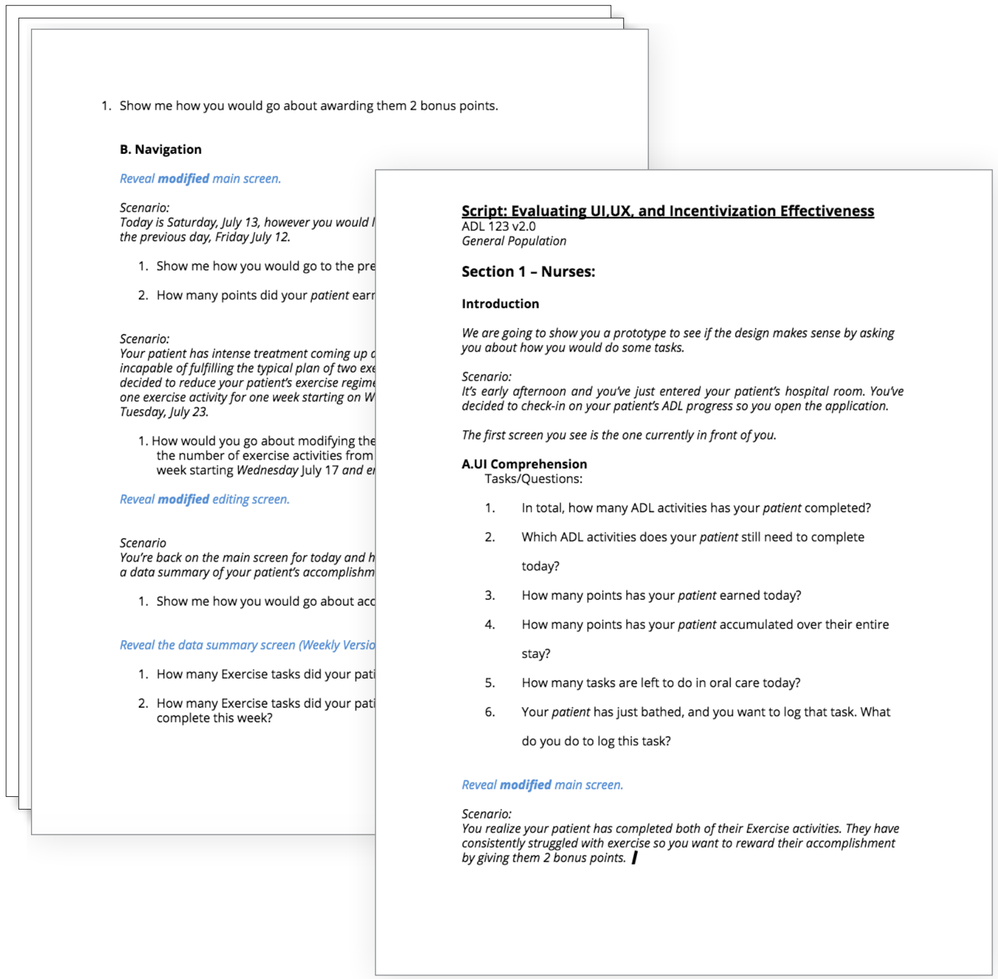
Based on feedback, it was determined that the data visualization needed to focus on giving staff and family quick visual feedback of which individual ADL tasks patients were either struggling or succeeding with. It also needed to offer a data visualization on the overall success progress trends for the week and month. Ideally this feedback would give staff and family a way to see a correlation in how each step of the patient journey affects compliance, and then begin a conversation on how to make improvements.

Application Map



Usability Testing: Digital Prototype

From the updated testing results, we moved forward with a digital prototype. The team created a usability script as well as a quick semi structured interview to test the app with 6 stakeholders. Overall there was a very positive response to the usability updates. The concept of recording the activities was easily understood. Editing and customizing the activities were significantly streamlined. Data visualization and feedback was clear and quickly engaged the staff. Finally, the incentivization system was enjoyed by patients. Users felt like the overall experience and purpose of ADLs was correctly presented by the app.



1. Show me how you would go about awarding them 2 bonus points.

B. Navigation

*Reveal **modified** main screen.*

Scenario:
Today is Saturday, July 13, however you would l
the previous day, Friday July 12.

1. Show me how you would go to the pre
2. How many points did your *patient* earr

Scenario:
Your patient has intense treatment coming up c
incapable of fulfilling the typical plan of two exe
decided to reduce your patient's exercise regime
one exercise activity for one week starting on W
Tuesday, July 23.

1. How would you go about modifying the
   the number of exercise activities from
   week starting *Wednesday* July 17 *and e*

*Reveal **modified** editing screen.*

Scenario
You're back on the main screen for today and h
a data summary of your patient's accomplishm

1. Show me how you would go about acc

Reveal the data summary screen (Weekly Versio

1. How many Exercise tasks did your pati
2. How many Exercise tasks did your pati
   complete this week?

Script: Evaluating UI,UX, and Incentivization Effectiveness
ADL 123 v2.0
General Population

Section 1 – Nurses:

Introduction

We are going to show you a prototype to see if the design makes sense by asking you about how you would do some tasks.

Scenario:
It's early afternoon and you've just entered your patient's hospital room. You've decided to check-in on your patient's ADL progress so you open the application.

The first screen you see is the one currently in front of you.

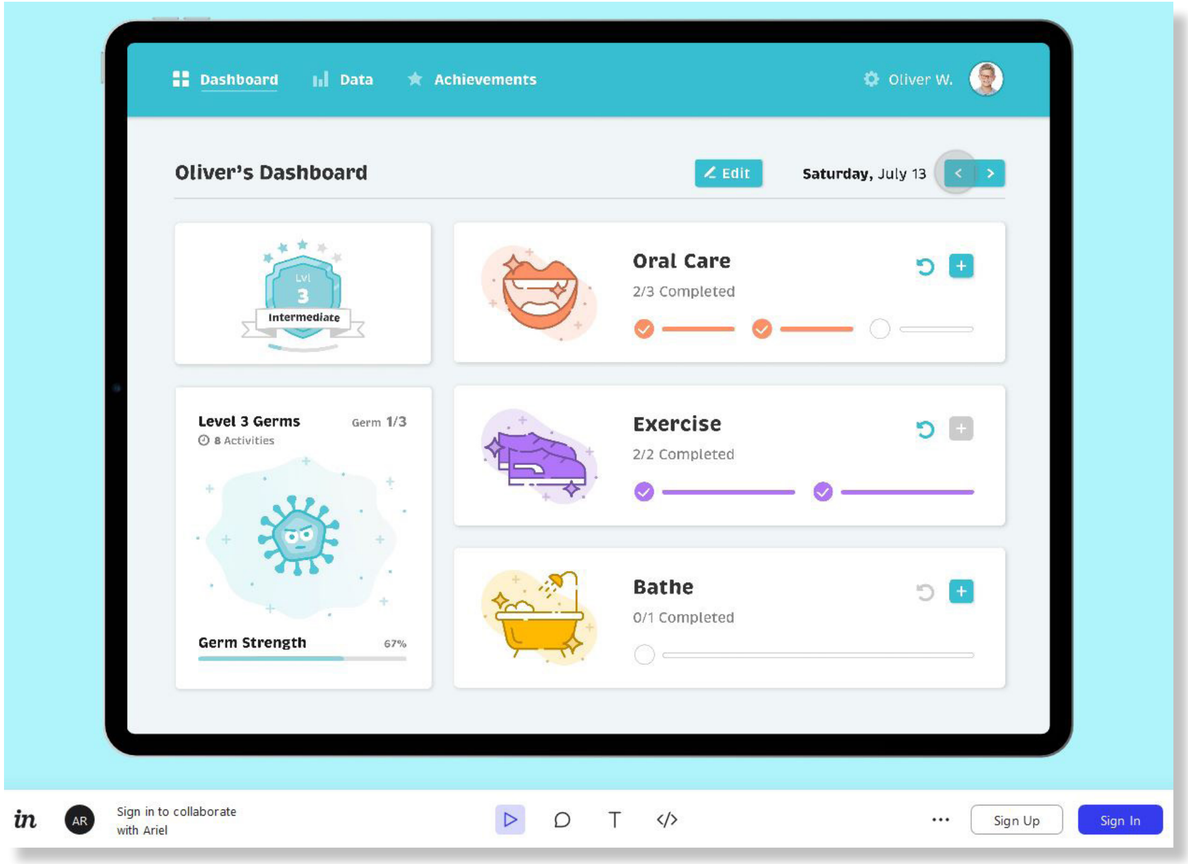
A.UI Comprehension
Tasks/Questions:

1. In total, how many ADL activities has your *patient* completed?
2. Which ADL activities does your *patient* still need to complete today?
3. How many points has your *patient* earned today?
4. How many points has your *patient* accumulated over their entire stay?
5. How many tasks are left to do in oral care today?
6. Your *patient* has just bathed, and you want to log that task. What do you do to log this task?

*Reveal **modified** main screen.*

Scenario:
You realize your patient has completed both of their Exercise activities. They have consistently struggled with exercise so you want to reward their accomplishment by giving them 2 bonus points.

Usability Testing Interview Guide

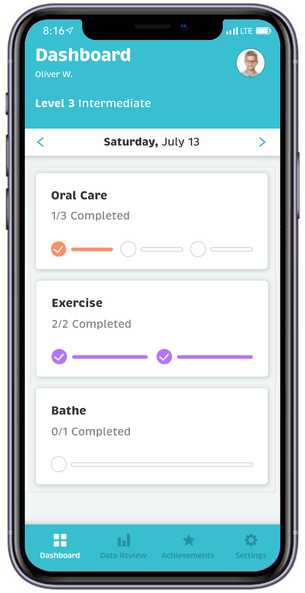


https://projects.invisionapp.com/prototype/123Prototype-ck9isopo8000i8t01q0rk2uqv/play/c62fa6c6

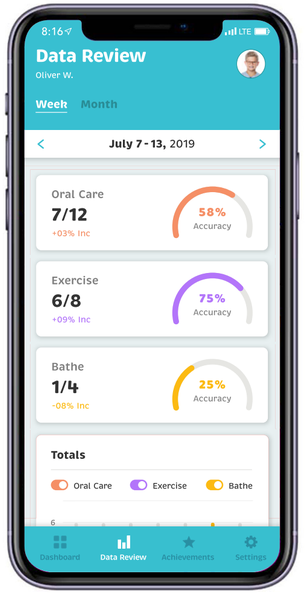
Remote Family Caregiver Needs

As the project came to a close, the team planned the addition of a mobile based version of the app. With this, remote caregivers would be able to rejoin in the patients care from outside locations or times.

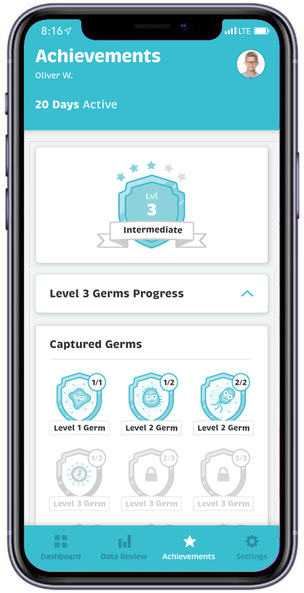
Task Review



Data Summary

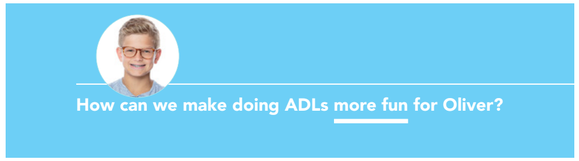


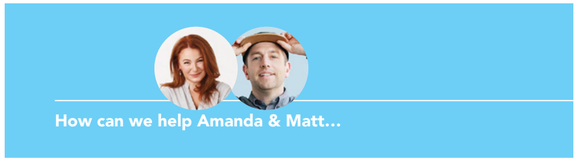
Incentivization Review



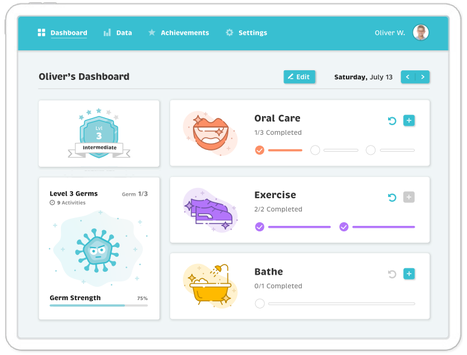
Reflection

During this project, I gained the intangible skills of interviewing and designing for young users. Researchers and designers must really put themselves in the shoes of the stakeholder when creating material to interact with them. During usability testing, I learned you must be vigilant about addressing bias. In hindsight I noticed the design team ,unbeknown to us, form questions that were leading. Some questions were trying to force validation in the design rather than assessing things at face value. In the future, I plan to test the teams questions with co-workers outside of a project before putting them in front of users. This project is now being handed off to Cincinnati Children's technical team to determine next steps in development.

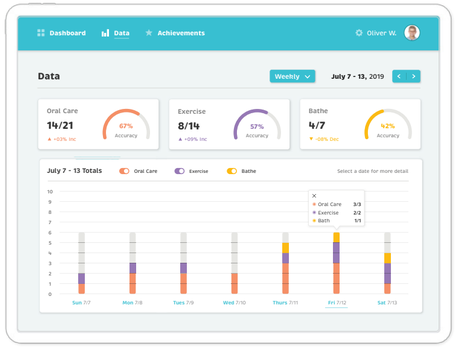




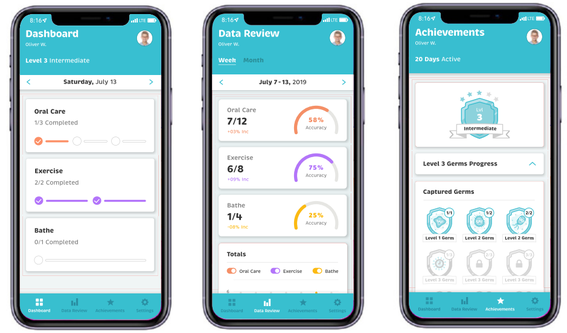
ADL task entry



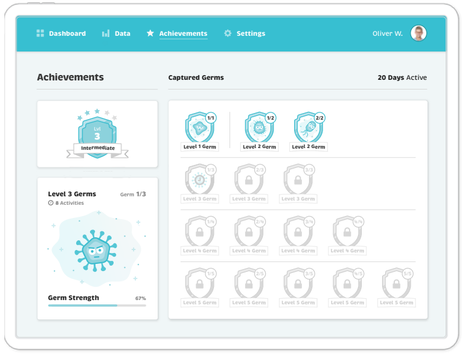
Data visualization and share decisions



Sidekick app for remote caregivers



"Defeat the germ" incentivization



ADL plan flexibility