T1Trackr

End-to-end iOS Application for Parents and Caregivers of Type 1 Diabetics

CORI JADE

May 2022

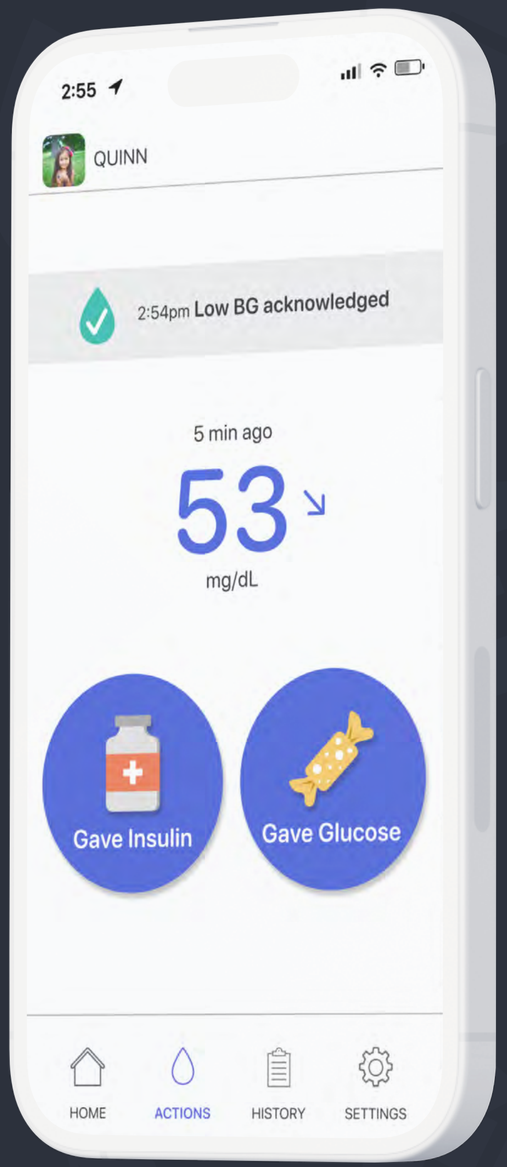
What is T1Trackr?

T1Trackr is an iOS application created for parents and caregivers of Type 1 diabetics. It allows users to see when high or low blood glucose levels have been acknowledged and treated by someone else.

a Kickoff

b Hypothesis

c Background



a Kickoff

This project was done as part of DesignLab's UX Academy -
Designing an end-to-end application

Choosing a problem space to focus on was the **biggest hurdle.** With endless possibilities, **what do I want to create a mobile app for?**

It needed to be something **I really care about** and it needed to **have a positive impact** or help people in some way.

Diabetes!

b Hypothesis

Based on **my personal experience as a mom of a type 1 diabetic**, I struggle to know what's happening with my son's care when he's not with me. There is often a **huge disconnect in communication**.

I believed other parents struggled with the same situation but that was **based on an assumption**. I needed to **validate that it was a problem for more people**.

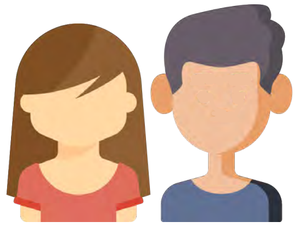
c Background

Type 1 diabetes (T1D) is an autoimmune disease that occurs when a person's pancreas stops producing insulin, the hormone that controls blood-sugar levels. **Approximately 1.6 million Americans are living with T1D, this includes almost 200,000 children.**

Managing Type 1 Diabetes isn't easy. High blood sugar is bad; really low blood sugar can be life-threatening.

With daily blood sugar fluctuations and insulin dosing, it can feel like riding a rollercoaster - especially for caregivers of young T1Ds. Throw in school, sports and multiple people making the 200+ healthcare decisions every day and it gets complicated — fast.

About 187,000 people under the age of 20 have Type 1 Diabetes.



Empathize

My familiarity with Type 1 diabetes management meant this project was something I was passionate about, but also an area where **I had a lot of assumptions and biases.**

I really wanted to learn about the experience of other caregivers to **understand if there were common problem areas** in order to discover the core needs for an MVP.

a Reasearch

b User Persona

c Takeaways

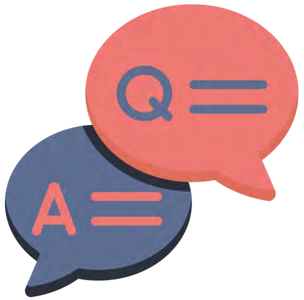
a Research

20+

Research Articles Reviewed

5

User Interviews Conducted



4

Similar Apps Compared

User Interviews

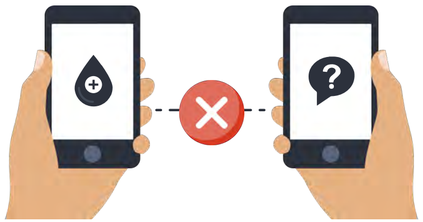
Seeing her blood sugar constantly is a blessing and a curse. It's great to know what's going on but then I don't have enough info to know what needs to be done

I just wish I knew if the nurse had already given her insulin or if I need to text to ask her to.

I hate to be *that* person, micromanaging everything, but I sort of have to be.

Interview Findings

Parents don’t have enough information about their child’s diabetes management



Similar apps do not share care decisions between users

A lack of communication between caregivers results in stress & concern

Competitive Analysis

Since this project was based on a hypothesis, **I chose to do my competitive analysis and desk research after my user interviews.**

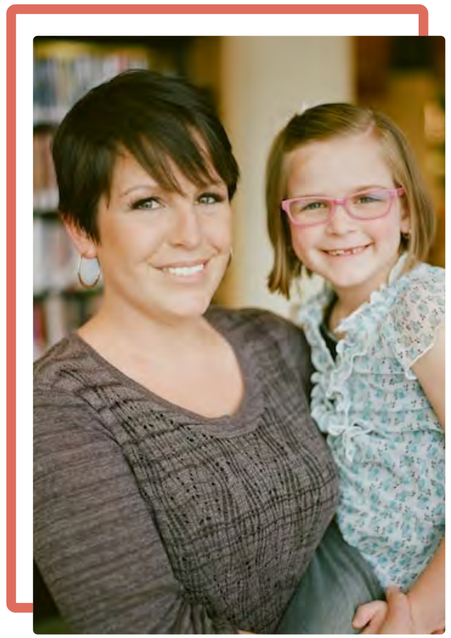
This allowed me to **focus my secondary research on my interview findings.** Although none of these are direct competitors, it helped me **identify features that could be beneficial and shortcomings to avoid.**

	Dexcom Follow	Sugarmate	HappyBob	Nightscout
Website	dexcom.com	sugarmate.io	happybob.app	nightscout.github.io
Platforms	iOS, Android	iOS, Android	iOS, Android	iOS, Android
Target Users	Caregivers	Type 1 diabetics, caregivers	Type 1 diabetics	Type 1 diabetics, parents
Features	• Real time blood glucose readings • Customizable BG alerts in app	• Customizable text/call alerts for BG fluctuations • Real time blood glucose readings (via Dexcom) • Stats/graphs of BG levels • Food/activity tracking • BG trends & reports	• Real time blood glucose readings (via Dexcom) • Customizable BG alerts in app • Interactive displays • Rewards system for time in range • Sharable with ‘diabuddies’	• Real time blood glucose readings • “CGM in the cloud” allows you to track another person’s data from pretty much anywhere there is internet access • Customizable alerts
Strengths	• Easy setup • Allows caregivers to track multiple users • Graph of BG trends • Minimal information = simple interface	• Easy setup • Allows caregivers to track 2+ users • Alerts all users of pre-set BG warnings • Allows input of carbs/insulin • Urgent low SMS alerts others if user is dangerously low • Nutritional database	• Easy setup • Fun, interactive interface - well reviewed • Snarky taglines make BG management fun • Color, emoji faces for at-a-glace recognition if user is in range, low, high	• Data available on any device with internet • Graphs/stats are very comprehensive for analyzing trends • Works with any device that can get access to the internet
Weaknesses	• Only focused on BG readings • Alerts can’t be ‘snoozed’ • No data if treatment has been given • No information on insulin dosing	• Primarily focused on BG readings • Inputting information is time consuming • No way for users/caregivers to communicate what’s been done • Platform is the same for users/ caregivers	• ‘Diabuddies’ is more for support/encouragement than sharing data • No data if treatment has been given • Stats/certain features are only available in paid version	• Very difficult/time consuming to set up • Primarily focused on BG readings • No data if treatment has been given • Costs may vary for database capacity long-term

b User Persona

Creating a user persona helped me look at the problem **based on my research** and **not my own experiences.**

Having so much familiarity with the problem space, **it required a lot of effort to step back and look at the situation objectively.**



Overwhelmed Kate

“I feel sick to my stomach when I see that her blood sugar is dropping at aschool and I don’t know if anyone has seen it or done anything about it.”

About

Mom of 3
Office manager
Wheaton, IL

Brands

omnipod simplify life | iPhone | dexcom CONTINUOUS GLUCOSE MONITORING

Kate’s 6 year old daughter, Quinn, is in 1st grade and has Type 1 Diabetes. After 2 years of managing the disease, Kate (and her husband, Steve) feel pretty comfortable managing blood glucose fluctuations at home.

School is a different story. They love their school nurse but sometimes she gets busy taking care of other kids and forgets to text updates, leaving Kate and Steve wondering if Quinn’s low blood glucose has been treated or if they should be worried.

Kate hates to pester her but needs to know that Quinn’s low BG has been noticed and that she has been given glucose to stay in a safe blood glucose range.

Motivations

- To be kept in the loop about Quinn’s BG treatment
- To find out if a high/low BG has been treated as quickly as possible
- A convenient way to communicate between all caregivers about high/low BG treatment decisions

Needs

- To know if a high/low BG has been noticed and treated with insulin/glucose
- A simple way to communicate treatments with the school nurse
- For both parents to be able to see the information relayed from the school nurse

Frustrations

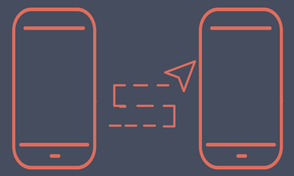
- Not knowing if a high/low blood glucose has been noticed and treated
- Doesn’t want to pester an already overwhelmed school nurse unless it’s an emergency
- Feels scared/worried when she doesn’t know if Quinn has been given insulin/glucose for high/low BG

c Takeaways

Parents feel anxious when their T1D is with someone else and they don't know if a high or low blood glucose reading has been noticed or treated. **There are apps in a similar product space** but they primarily monitor blood glucose levels, **their focus is not on sharing data between caregivers.**

Focus should be on:

Real-time blood glucose readings linked to Dexcom



Sharing treatment actions between caregivers

Easy to enter insulin/ glucose information

Customizable alerts

Available on iOS & Android

Ease of use/setup

Define

Understanding where our users were **experiencing frustrations** and **if there were any direct competitors** allowed me to determine if there was a problem that could be solved with a new app. **Now I needed to bridge the gap between research and ideation.**

a Defining the Problem

b Creating a Solution

c Takeaways

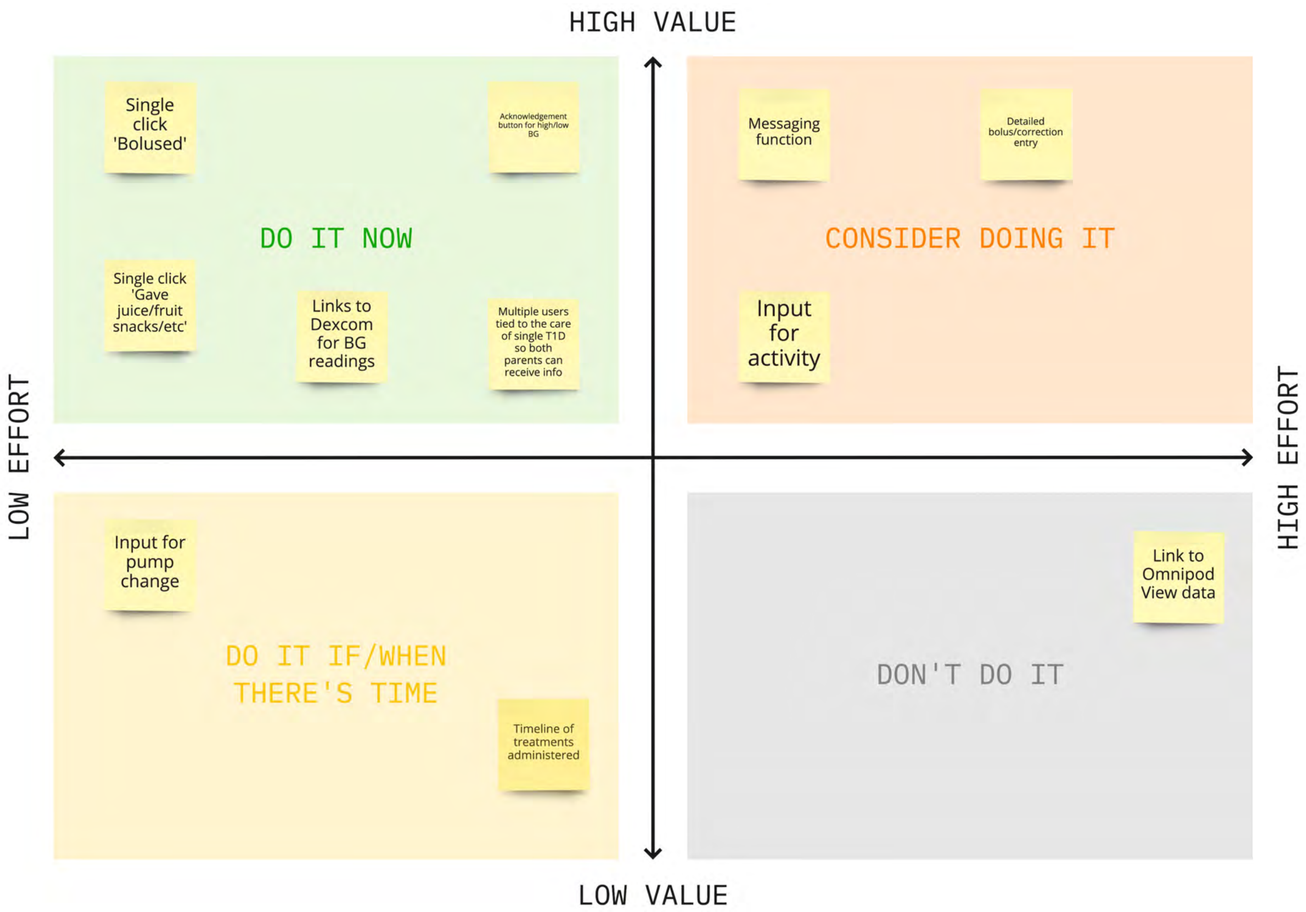
a Defining the Problem

My research led me to **3 specific tasks to solve.**

Using a Point-of-View Statement and How-Might-We questions helped me **compartmentalize each problem** and brainstorm **possible solutions.**

b Creating a solution

I looked at the solutions that solved all 3 problems and created a prioritization matrix to **determine what to focus on for an MVP,** what could come later, and what wasn't worth adding.



c Takeaways

For an MVP, my focus would be on **multiple users interacting with an interface that shows real-time blood glucose data and single click buttons to communicate care decisions.**

Ideate

This process provides so much clarity for me! It really **helps me see where something is missing** or what actions can be taken to increase user retention along the way.

a Sitemap & Product Requirements

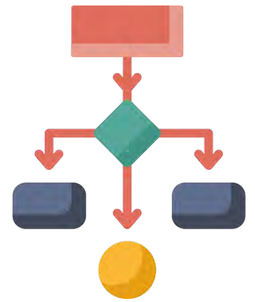
b Task Flows

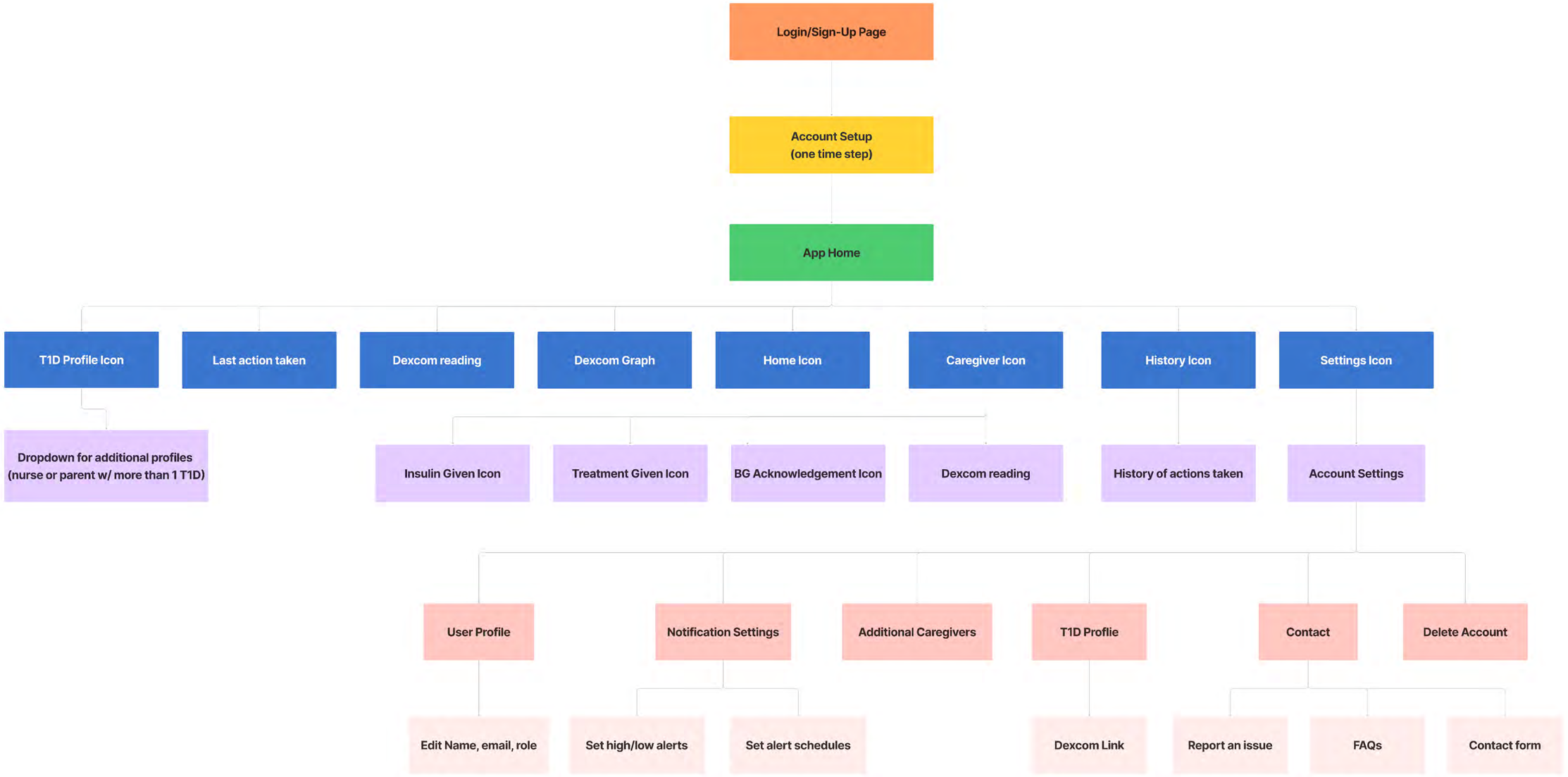
C User Flows

a Sitemap & Product Requirements

To determine **how all the features would integrate**, I created a site map and product requirements document.

These documents evolved as I worked on the task flow and user flow.

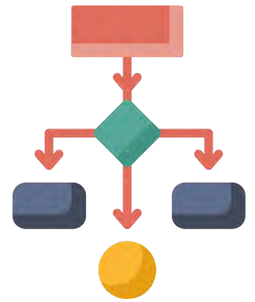



Login/Sign-Up Page
Account Setup
(one time step)
App Home
T1D Profile Icon
Last action taken
Dexcom reading
Dexcom Graph
Home Icon
Caregiver Icon
History Icon
Settings Icon
Dropdown for additional profiles
(nurse or parent w/ more than 1 T1D)
Insulin Given Icon
Treatment Given Icon
BG Acknowledgement Icon
Dexcom reading
History of actions taken
Account Settings
User Profile
Notification Settings
Additional Caregivers
T1D Proflie
Contact
Delete Account
Edit Name, email, role
Set high/low alerts
Set alert schedules
Dexcom Link
Report an issue
FAQs
Contact form

User Task	Feature	Description	Reason to Include
Download/setup the app	Login/Sign-up	Allows users to login/create an account, forgot password	Competitive Analysis
	Account Setup	Account creation: name, email, role, password setup, TOS, Privacy, Disclaimers	Competitive Analysis
	T1D Profile	Add name, photo of T1D (especially helpful if there is more than one that a caregiver is monitoring)	Competitive Analysis
	Notification Settings	Set up high/low BG alert thresholds and notification preferences	
	Link Dexcom	Links Dexcom CGM data	Competitive Analysis
	Dexcom Popup Acknowledgement	Disclaims that these are not medical instructions and is to be used for information purposes only	Competitive Analysis
	Invite Additional Caregivers	Input email address to send invitation link for this T1D to additional caregivers	Competitive Analysis, User Interviews
View Data	Dexcom integrated CGM readings	Shows Dexcom data in real-time with BG number and trend graph	Competitive Analysis
	T1D Profile	Name and icon/image of T1D (can have multiple accounts for additional children)	Competitive Analysis, User Interviews
		Dropdown to switch view accounts	Competitive Analysis, User Interviews
	Low/High BG Acknowledgement	Shows acknowledgment of high/low BG with time stamp	User Interviews
	Action Taken	Shows last action taken (insulin, food, other treatment) with time stamp	User Interviews
Input Data	Insulin given	One-click icon to show that insulin has been given to correct a high BG reading	User Interviews
	Treatment given	One-click icon to show that food/juice/glucose tabs have been given to correct a low BG reading	User Interviews
	Acknowledgment	One-click icon to show that alternate caregiver/older T1D has seen that they are low/high	User Interviews
Account Settings	User Profile	Name, email, role	Competitive Analysis
	Notification settings	Set high and low BG alarms	Competitive Analysis
		Scheduled alerts - preset alert thresholds for different times of day	Competitive Analysis
	Additional Caregivers	Email invite to additional users to link to the same view account	Competitive Analysis
		Delete users	Competitive Analysis
	Dexcom Setup	Dexcom link	Competitive Analysis
	Contact	Contact form	Competitive Analysis
	Delete Account	Delete user account	Competitive Analysis

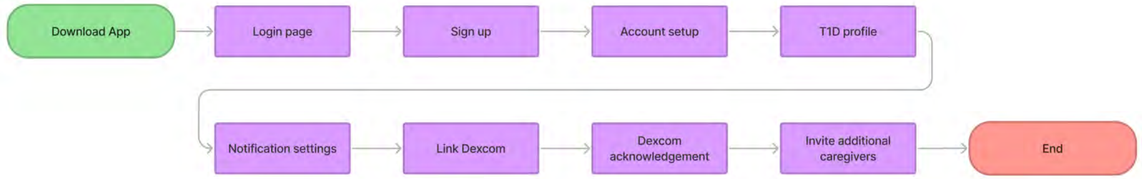
b Task Flows

Since this app is designed to relay communication between multiple parties, **I created 3 separate task flows to make sure I didn’t miss any steps in the interaction for either party.**



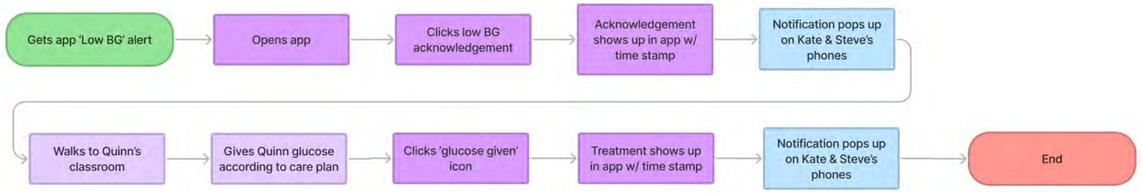
Task Flow 1

Kate wants to set up the app for the first time



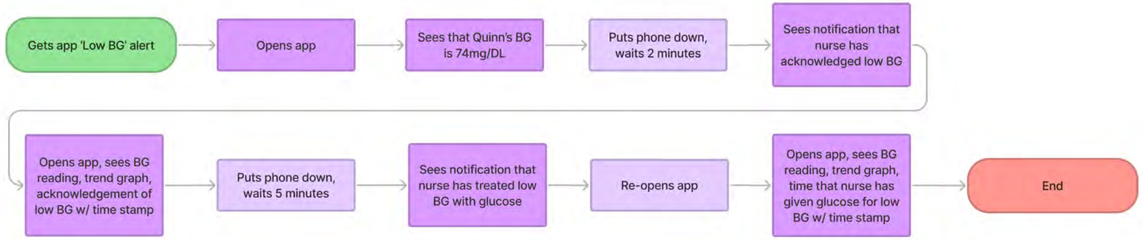
Task Flow 2

Quinn BG is low and her school nurse wants to inform Kate and Steve that she is aware of it and, a few minutes later, that she has given Quinn glucose to treat the low BG



Task Flow 3

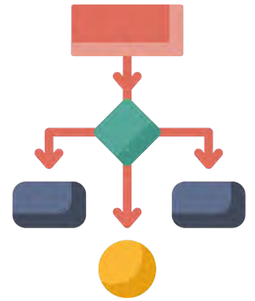
Kate gets an alert during the school day that Quinn's BG is low and wants to make sure it has been noticed and treated.



c User Flows

I mapped out the user's steps through the app in order to think about all the decisions that a user would make to complete the process. **I created one from a parent's perspective and one for an alternate caregiver since their journey would be slightly different.**

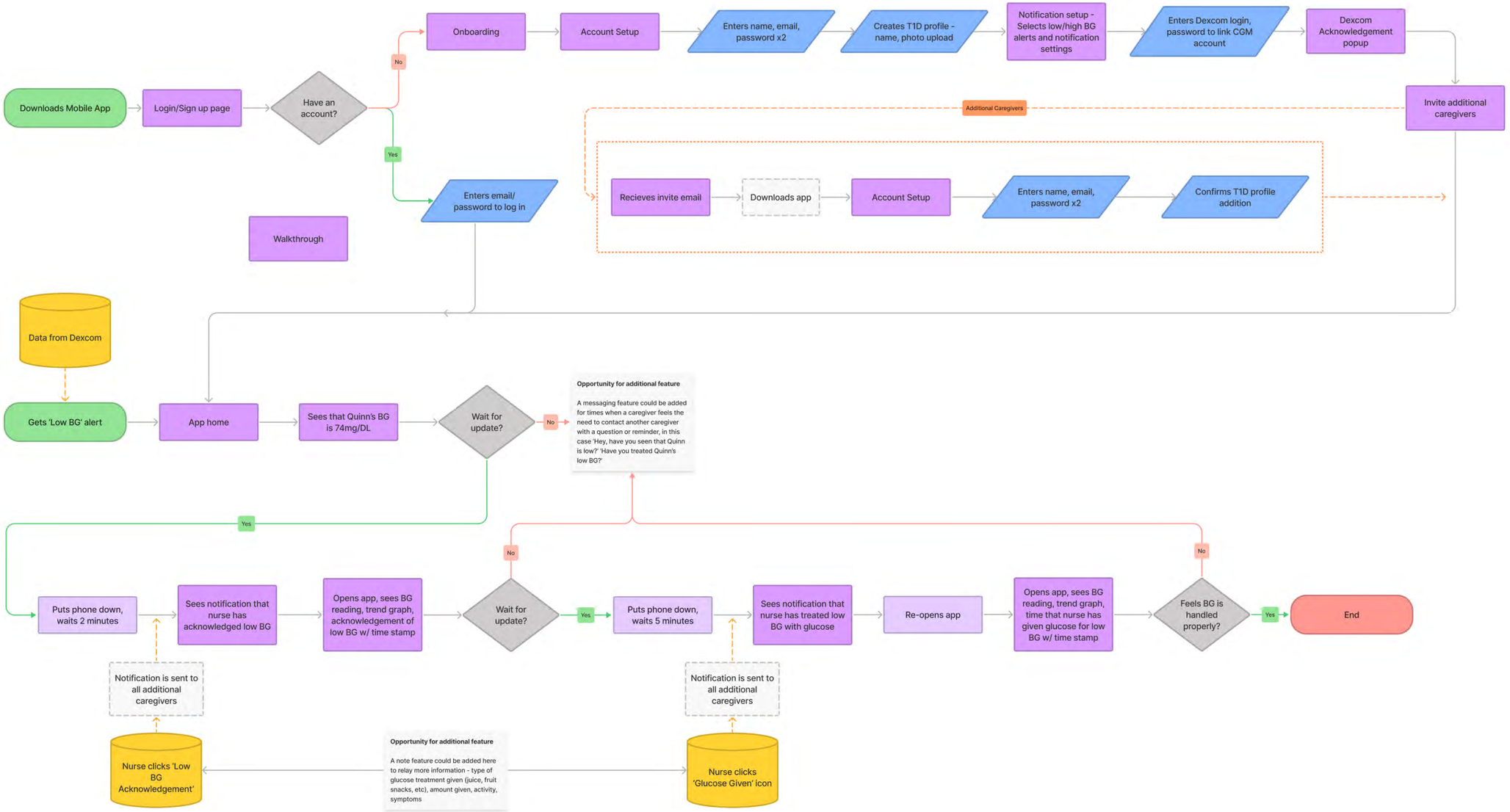
Since the purpose of the app is to **simplify communication** about care decisions, I wanted to make sure that there were **minimal decisions for the users to make.**



Parent User Flow

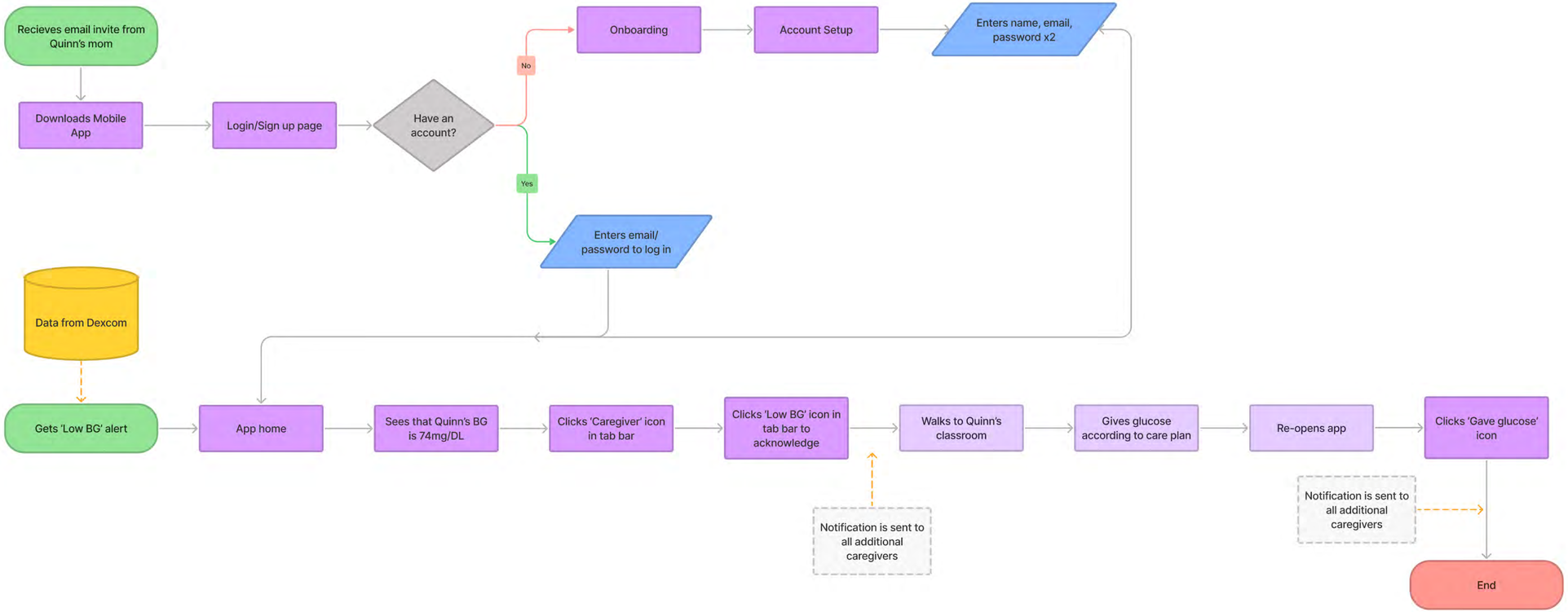
Kate wants to set up App and use it to communicate BG treatment decisions with Quinn's school nurse

Start | Decision | Action | Input | Process | Data | End



Nurse User Flow

Nurse Mary wants to setup App and use it to communicate BG treatment decisions with Quinn's parents while she's at school



Design & Prototype

I started sketching ideas based on my site map and user flow.

The **perfectionist part of me** hates sharing quick sketches because they’re messy and far from perfect. **I’m learning to appreciate the process and not overthink it.**

a Sketches

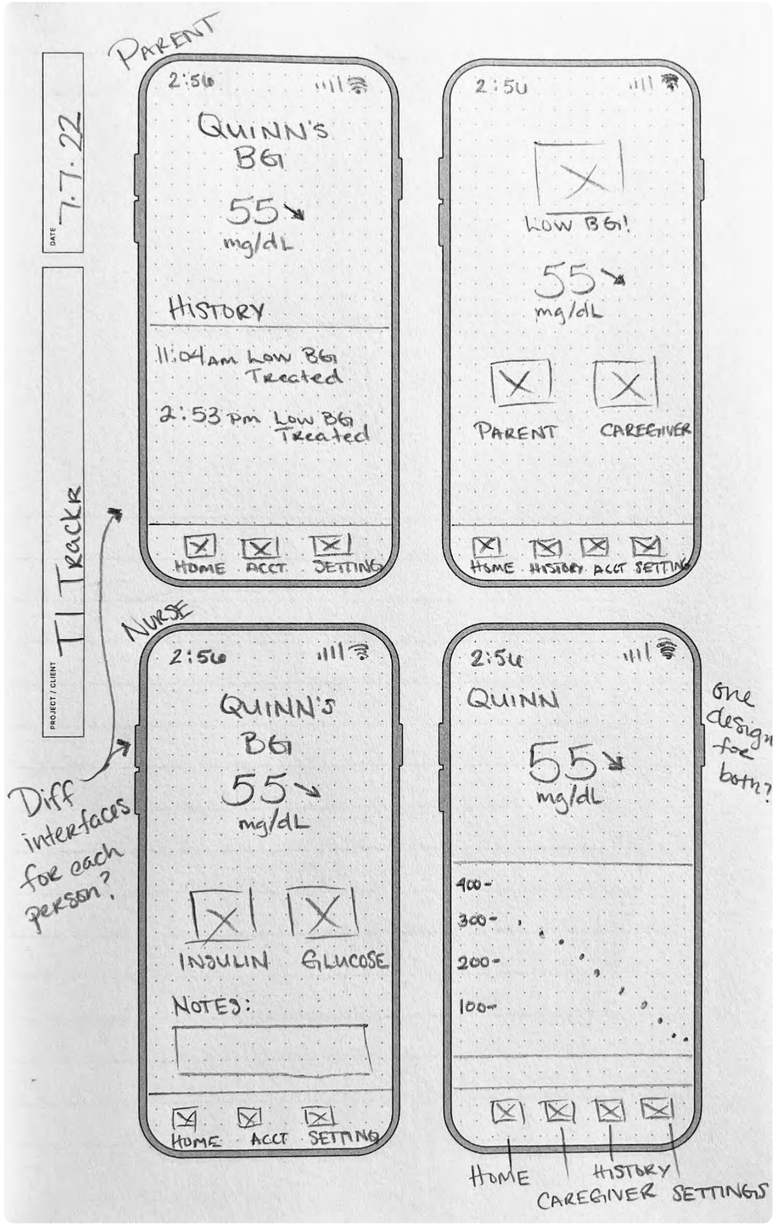
b Mid-Fi Wireframes

c Branding

a Sketches

Working in low-fidelity meant I was able to learn as I was designing, iterate quickly and try different options.

My initial idea was to have different designs for the parent and alternate caregiver but I discovered flaws in that approach as I sketched them and pivoted to a single interface that everyone could interact with.


PARENT
DATE
7.7.22
PROJECT / CLIENT
T1 Tracker
2:56
QUINN'S BG
55 mg/dL
HISTORY
11:04AM Low BG Treated
2:53 PM Low BG Treated
HOME ACCT SETTING
2:56
LOW BG!
55 mg/dL
PARENT CAREGIVER
HOME HISTORY ACCT SETTING
NURSE
2:56
QUINN'S BG
55 mg/dL
INSULIN GLUCOSE
NOTES:
HOME ACCT SETTING
Diff interfaces for each person?
2:56
QUINN
55 mg/dL
400
300
200
100
One design for both?
HOME
CAREGIVER
HISTORY
SETTINGS

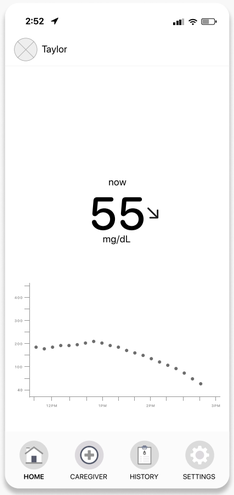
b Mid-Fi Wireframes

Due to time constraints for this project, I wanted to **test the functionality quickly** and focus on the UI and fine details once I knew what worked and what needed improvement.

1:07

All the data you need, in one place

All users can view the current blood glucose value, trend, graph history and set custom alerts



Skip Tutorial

2:52

Quinn

now

55↘

mg/dL

Low BG

HOME **CAREGIVER** HISTORY SETTINGS

2:54

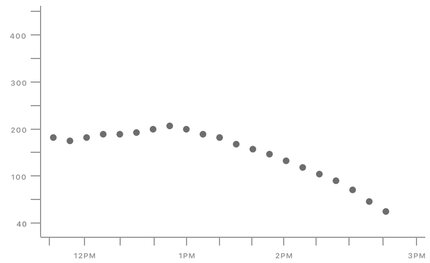
Quinn

2:54pm Low BG acknowledged

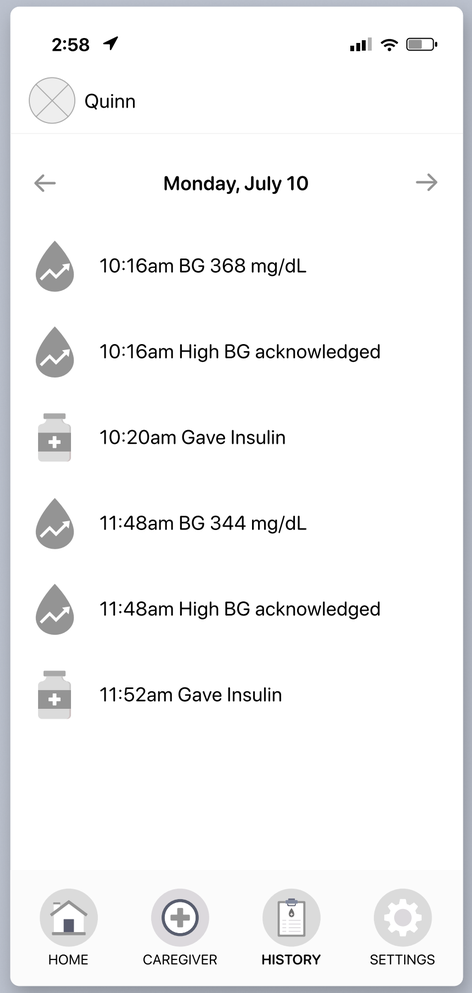
2 mins ago

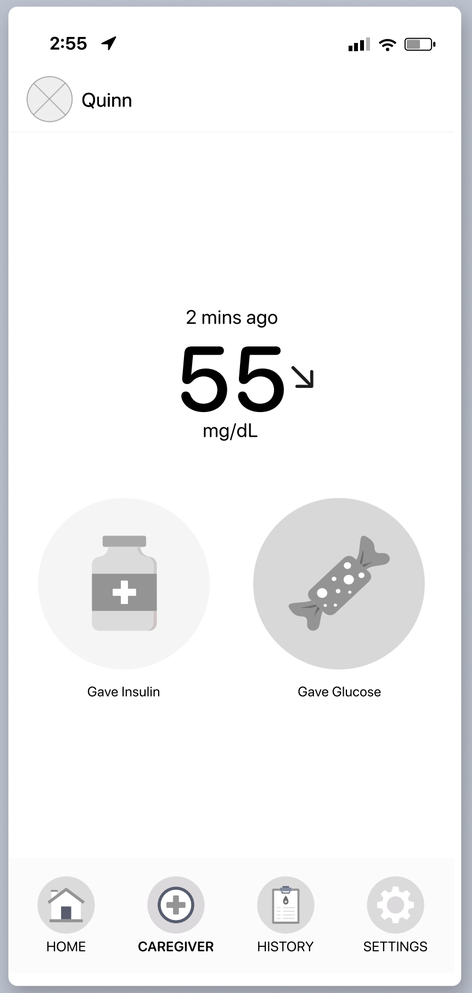
55↘

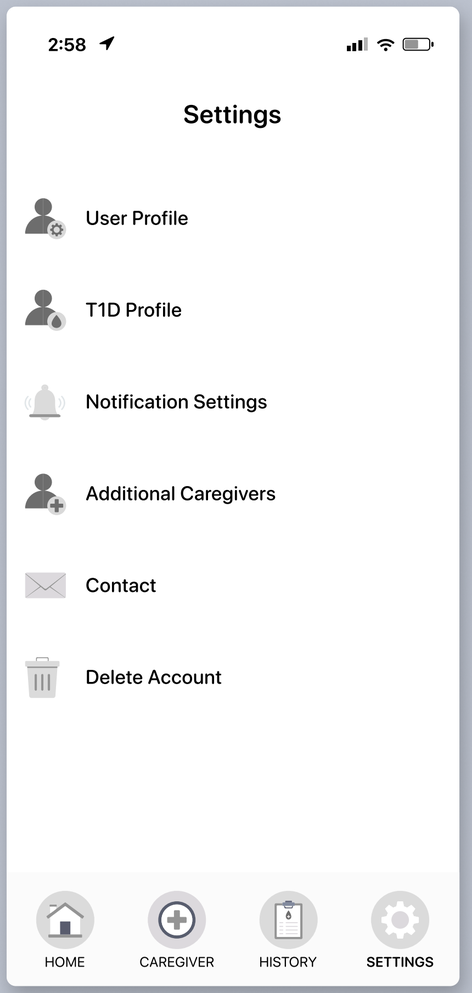
mg/dL



HOME CAREGIVER HISTORY SETTINGS


2:58
Quinn
Monday, July 10
10:16am BG 368 mg/dL
10:16am High BG acknowledged
10:20am Gave Insulin
11:48am BG 344 mg/dL
11:48am High BG acknowledged
11:52am Gave Insulin
HOME
CAREGIVER
HISTORY
SETTINGS

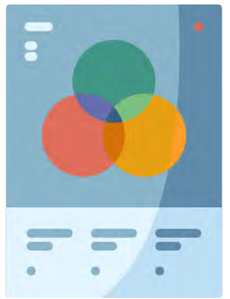

2:55
Quinn
2 mins ago
55↘
mg/dL
Gave Insulin
Gave Glucose
HOME
CAREGIVER
HISTORY
SETTINGS


2:58
Settings
User Profile
T1D Profile
Notification Settings
Additional Caregivers
Contact
Delete Account
HOME
CAREGIVER
HISTORY
SETTINGS

c Branding

For the sake of time, I worked on branding while I recruited and scheduled usability test participants.

Since medical apps can feel **cold and overwhelming,** it was important to **create an interface that would feel more approachable.**



T1Trackr

TYPOGRAPHY

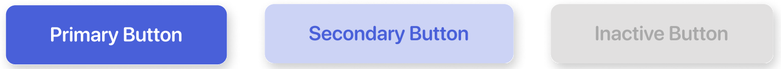
SF Pro Rounded

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmn
opqrstuvwxyz

ICONS

BUTTONS



KEYWORDS

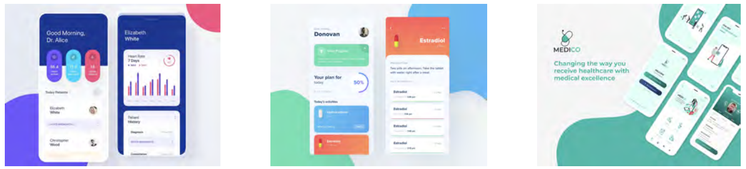
Simplicity. Communication. Informed.

COLOR PALETTE

Primary	Accent	Accent	Accent	Accent
#4960D9	#36BCAD	#ED5462	#F6C864	#ED7954

#292A33	#595C6E	#A9A9A9	#E1E0E0

IMAGES



Test

I knew I wanted to conduct my usability testing on mid-fi wireframes to **see if users could interact with the app without the aid of colors and images.**

a Usability Testing

b Priority Revisions

a Usability Testing

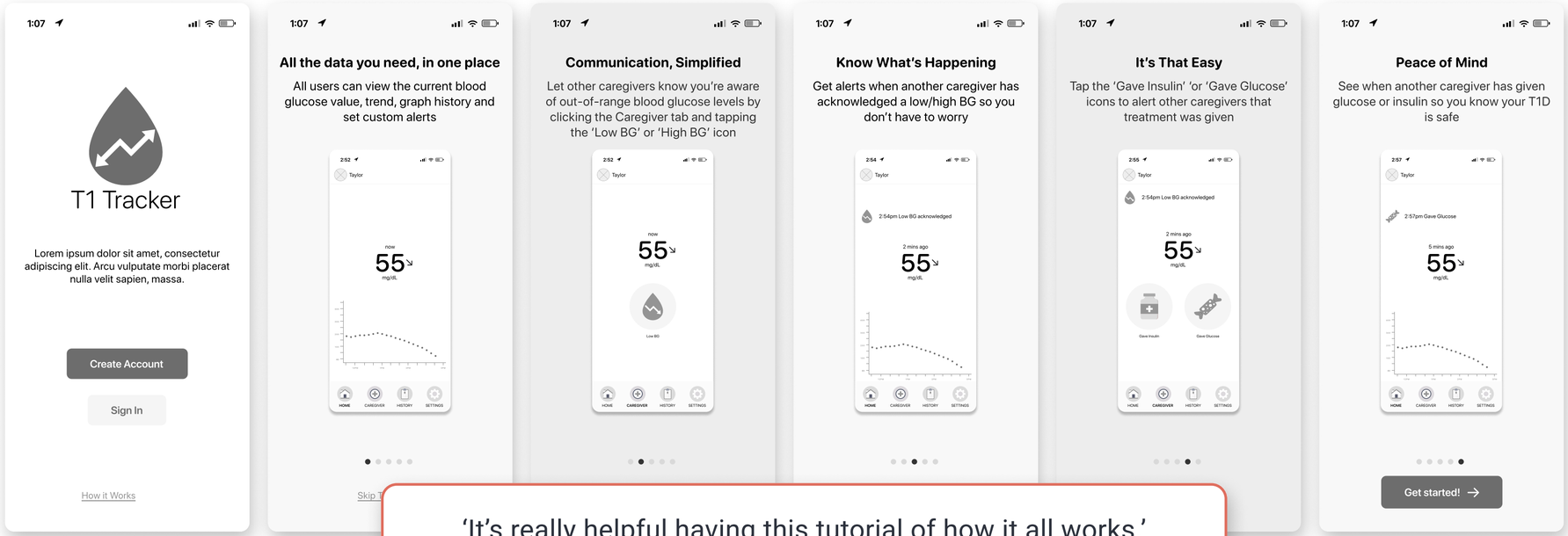
Usability testing is like Christmas morning for me!

I can’t wait to see how users interact with a product. **Their delight feels great.** Obviously. It means I succeeded in making something usable/enjoyable/functional. But it’s in their **moments of confusion or struggle** that feels like such a gift.

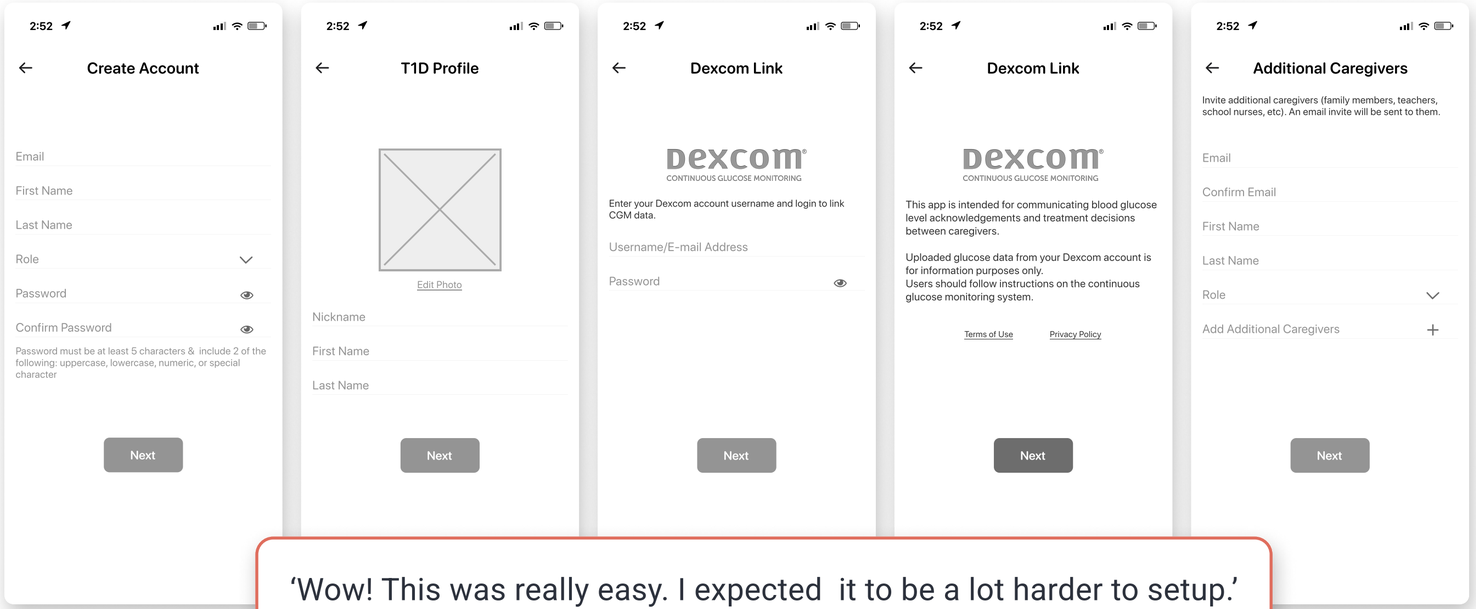
This sounds weird, I know. But anyone can make something that looks good, getting qualitive feedback to make a product better for the people using it is **why I love UX.**

You heard about a new app for T1D caregivers and want to check it out. You just downloaded it and want to set it up. How would you go about doing that?

Users commented on how they liked the explanation in the onboarding screens and that the setup was easier than they expected



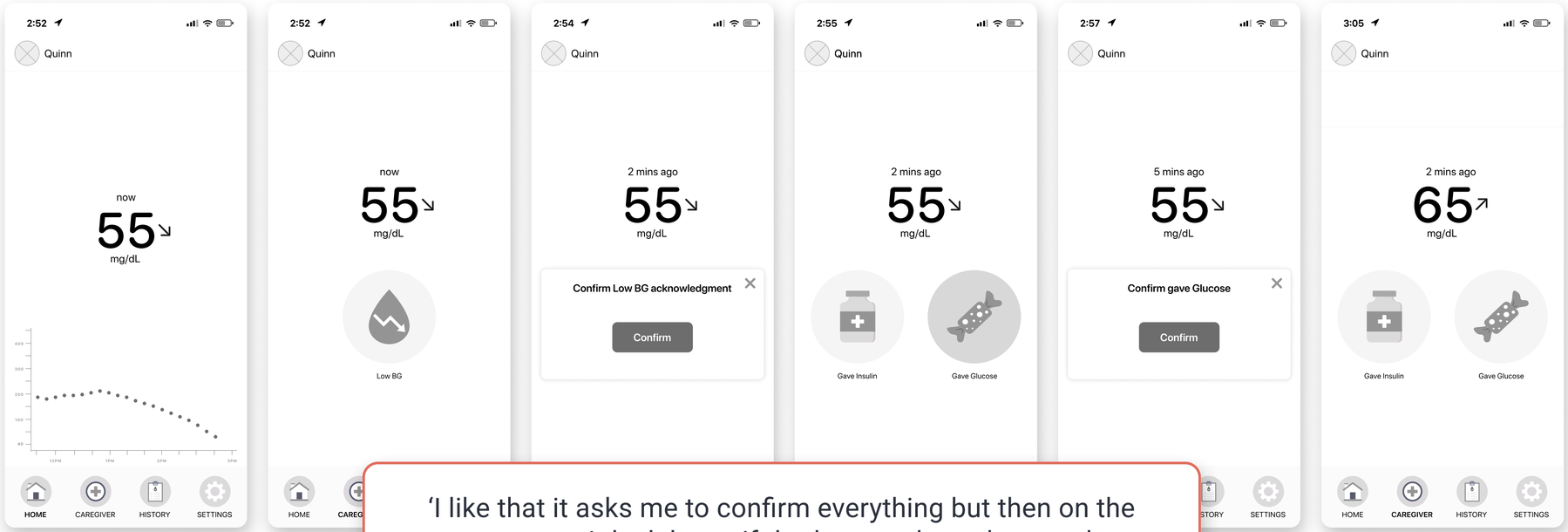
'It's really helpful having this tutorial of how it all works.'



‘Wow! This was really easy. I expected it to be a lot harder to setup.’

You have the app setup and you get an alert. Your spouse is out running errands but is always checking up on your child's BG levels. You want to let them know that you have seen the BG alert and that you have treated it. What do you do?

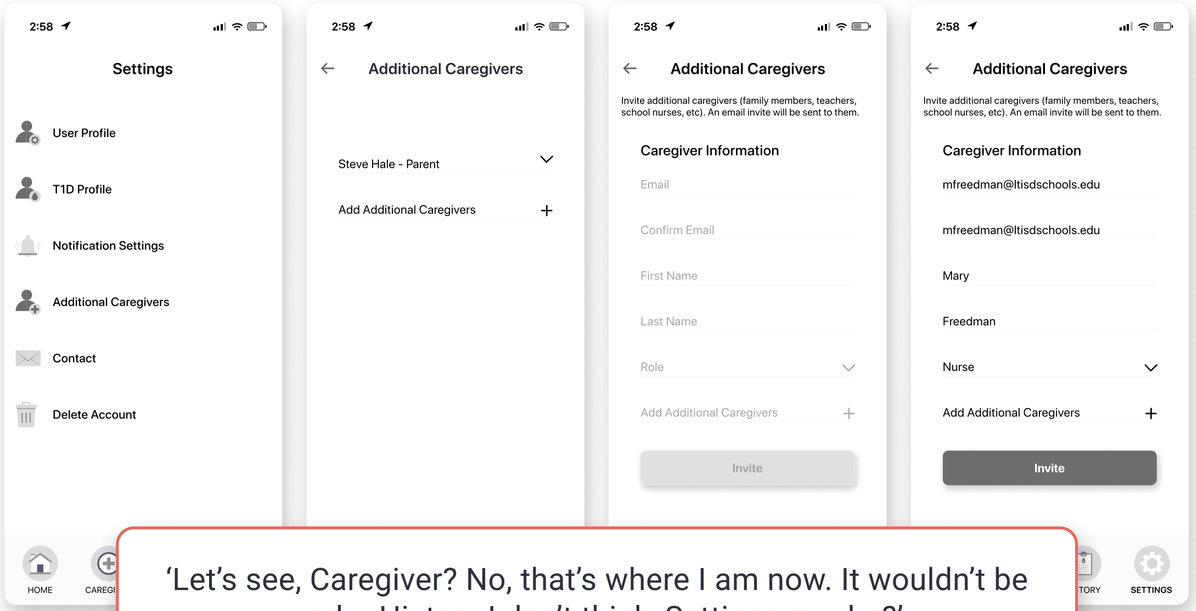
Users commented that they knew what to do here because of the onboarding screens but did express some confusion with the title of the 'Caregiver' tab and felt the 'Low BG' icon wasn't immediately clear as an action.



'I like that it asks me to confirm everything but then on the next part I don't know if that's gone through or not.'

Now you want to add your school nurse as an additional caregiver, what would you do?

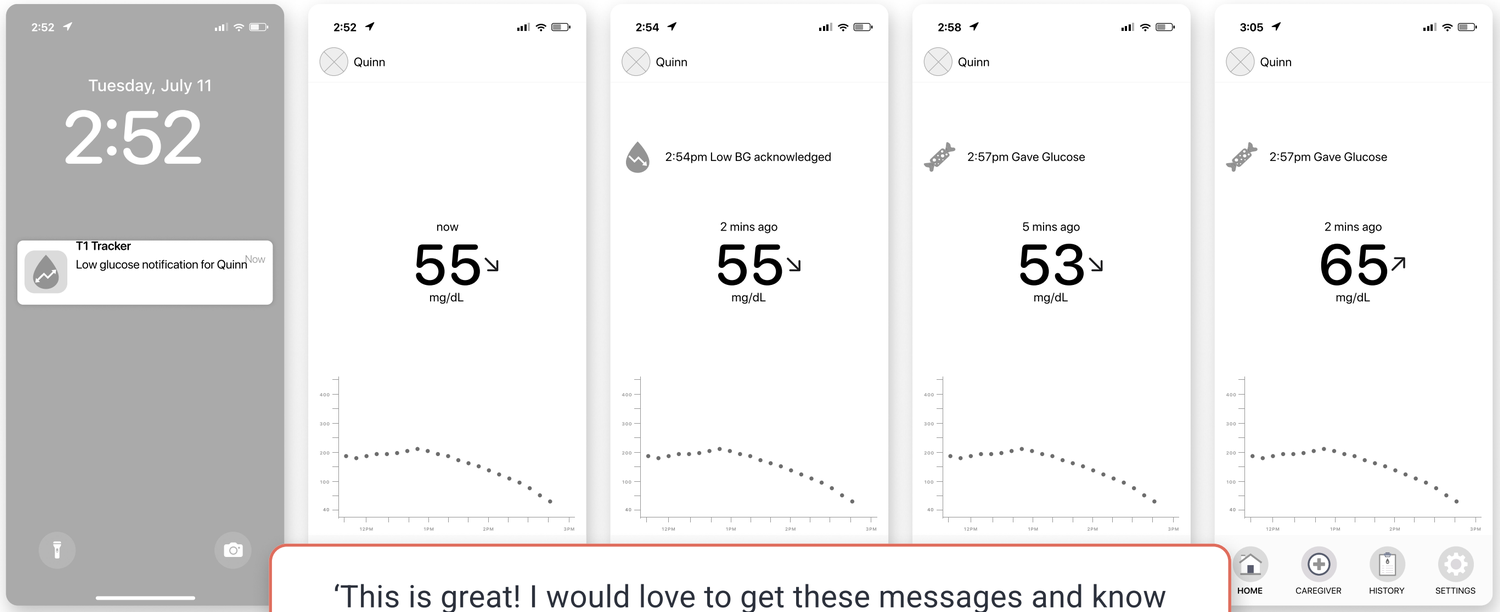
Users were able to quickly deduce where to add an additional caregiver and completed the task with ease.



‘Let’s see, Caregiver? No, that’s where I am now. It wouldn’t be under History I don’t think, Settings maybe?’

The school nurse is now following your child; you get an app alert while they're at school. What do you do?

This was prototyped to be time delayed to show users how they would see information if another caregiver was inputting it

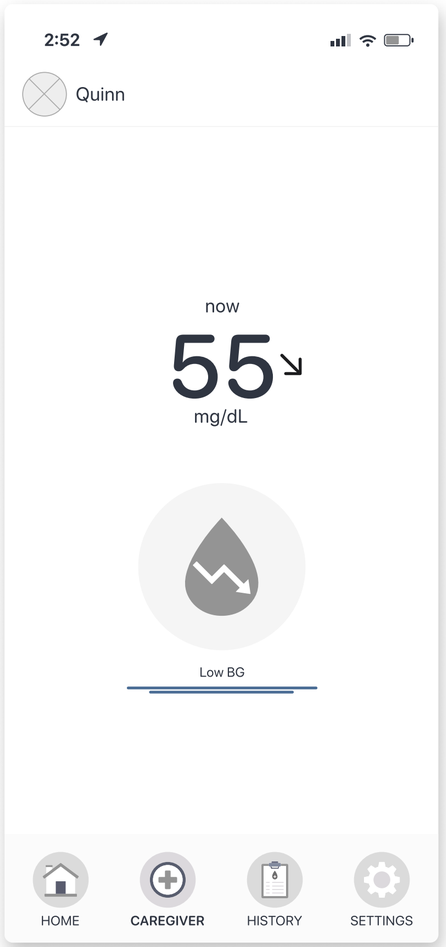


'This is great! I would love to get these messages and know what's happening without having to ask or feel like I need to respond to a text. It's a constant back and forth and I don't know when to reply, thumbs up a text, ignore it.

b Priority Revisions

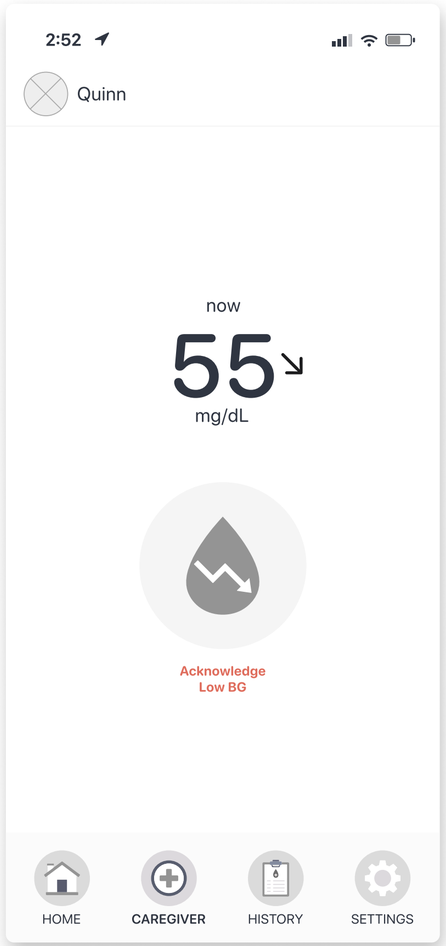
Usability testing and team review helped me uncover **areas that could be improved** and I implemented the following revisions:

Before Usability Testing

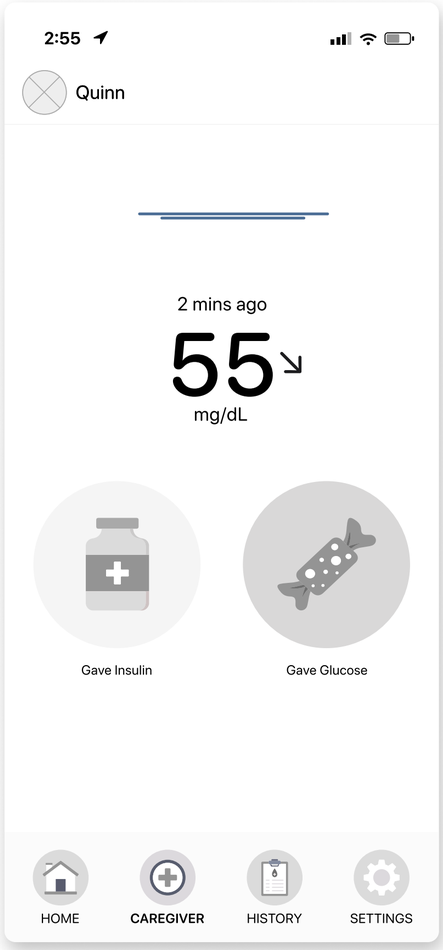


I added the word ‘Acknowledge’ to the Low BG and High BG buttons to clarify that it is an action to be taken, not a notification

After Usability Testing

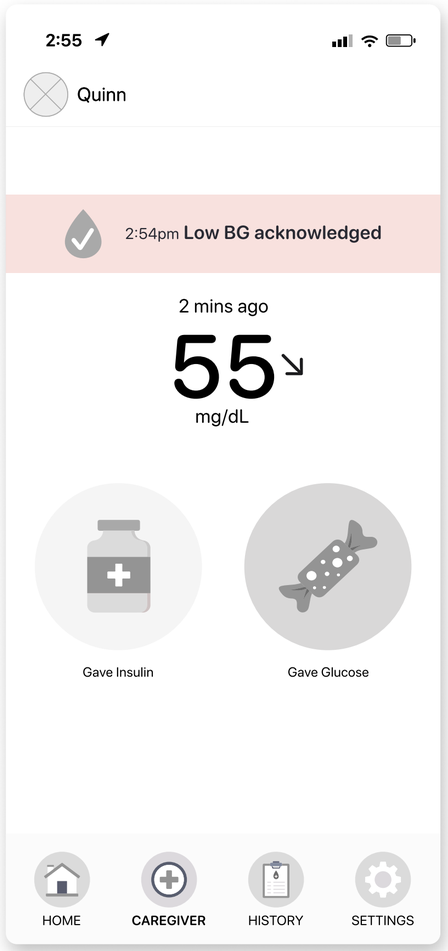


Before Usability Testing

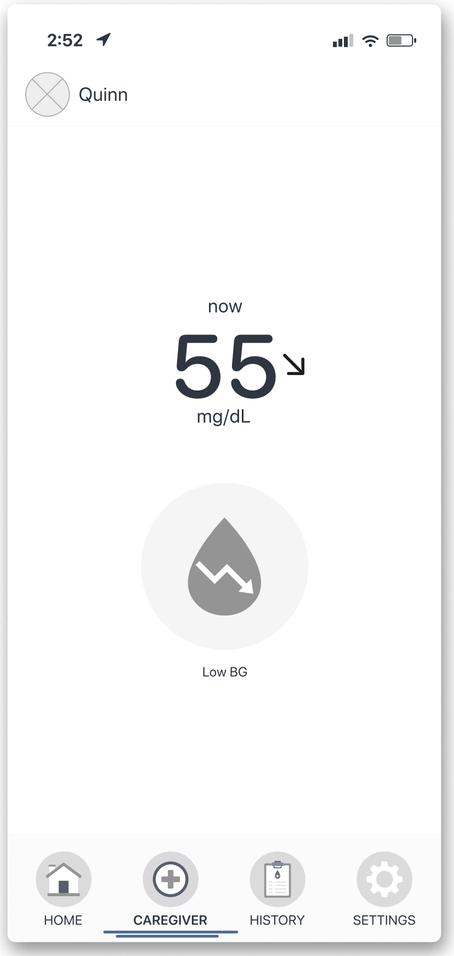


I added a notification at the top of the ‘Caregiver’ screen that the alert was relayed to other users to reduce uncertainty

After Usability Testing

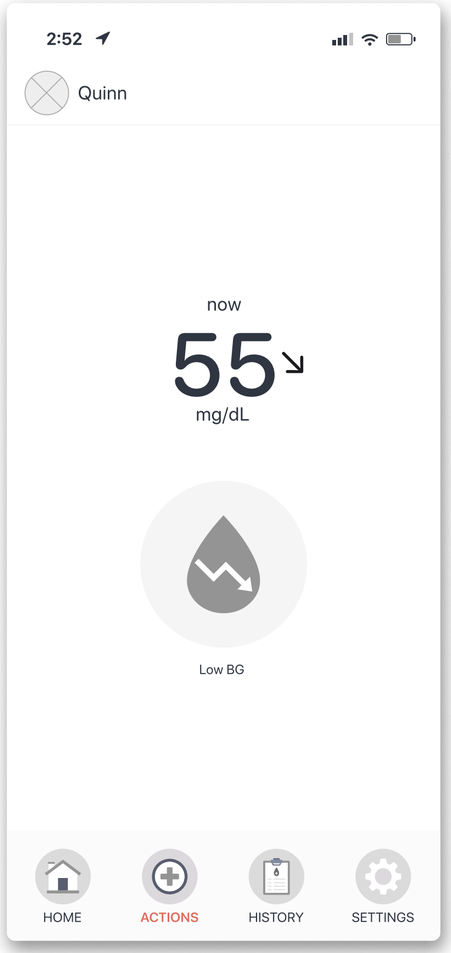


Before Usability Testing



I changed the verbiage from ‘Caregiver’ to ‘Actions’ for more clarity

After Usability Testing



UI Implementation

Next, it was time to bring the design to life!

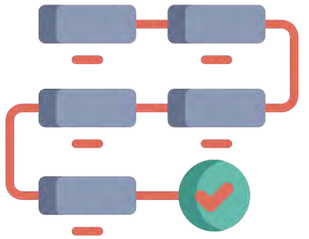
a Onboarding

b Hi-Fi Wireframes

a Onboarding

I wanted to start out with the main value proposition, though I do think this could be reworked to be **more concise.**

I believe that good design should be intuitive, but that teachable interactions shouldn't be undervalued. I wanted to show users **how and where they would interact with different features** so they would **feel confident using the app.**



1:07

T1 Tracker

Simplifying Type 1 Diabetes Communication

View real-time blood glucose data, set custom alerts, and input, share, and track care decisions for peace of mind that low and high blood glucose levels have been noticed and treated.

Create Account

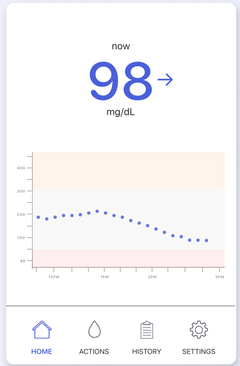
Sign In

How it Works

1:07

All the data you need

Multiple caregivers can view the current blood glucose values, trends, and graph history from the **Home tab**

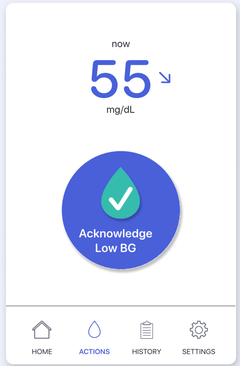


Skip Tutorial

1:07

Communication, Simplified

Share that you're aware of out-of-range blood glucose levels from the **Actions tab** by tapping the icon

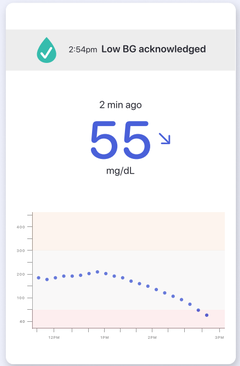


Skip Tutorial

1:07

Know What's Happening

Get alerts when another caregiver has acknowledged a low or high glucose reading so you don't have to worry

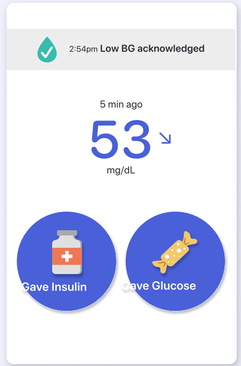


Skip Tutorial

1:07

It's That Easy

Tap the 'Gave Insulin' 'or 'Gave Glucose' icons to alert other caregivers that treatment was given

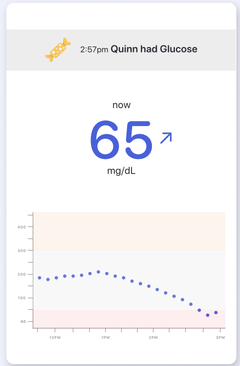


Skip Tutorial

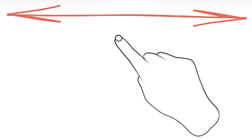
1:07

Peace of Mind

See when another caregiver has given glucose or insulin so you know your T1D is safe



Get started! →



b Hi-Fi Wireframes

Ahh, the finished product! I love when all the pieces finally come together.

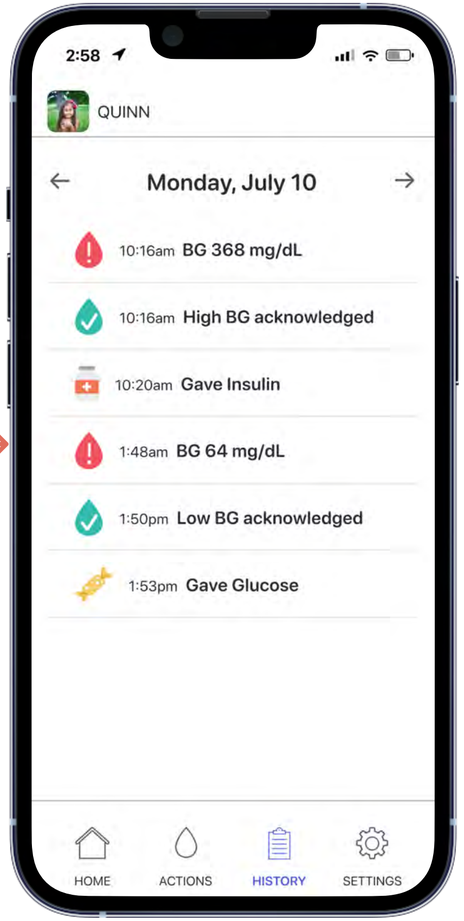
Lock screen notifications will show if the child's blood glucose is low or high, if it has been acknowledged by the alternate caregiver, and when insulin or glucose is given

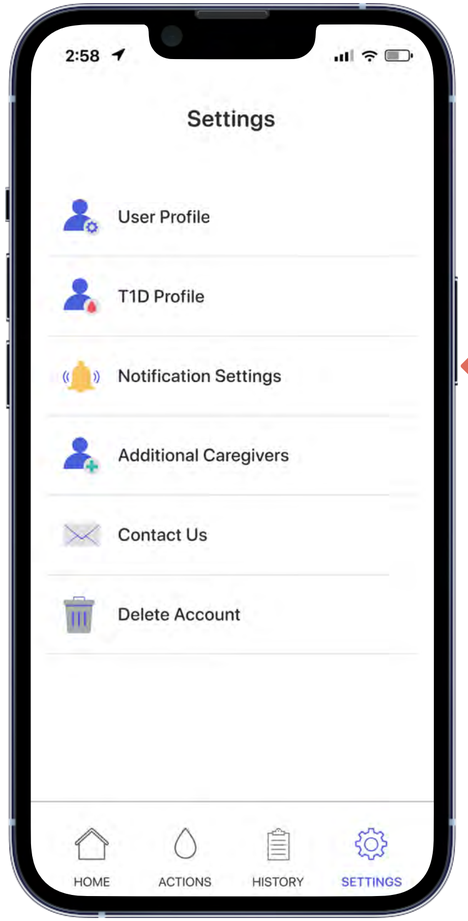
The graph background colors represent user-set high and low blood glucose thresholds so it is easy to see at-a-glance whether the child is in range or not

I kept these buttons the primary color since everywhere else within the app it implies an action, though the contrast ratio between the icons and primary color does not meet accessibility guidelines and could use improvement

Treatment decision icons are omnipresent unless there is a high/low blood glucose level to acknowledge so caregiver can share when they have preemptively given a treatment/ insulin for a meal

History of alerts and care decisions can be viewed quickly with icons to reduce how much the user needs to think to find the information they're looking for





Each user can set their own high and low glucose thresholds within the 'Notification Settings' as well as schedules for alerts to vary on different days/times

Conclusion

I wanted to create a product to solve my own problem and, in doing so, uncovered that other parents were struggling with it too.

T1 Trackr can simplify communication between parents and caregivers of Type 1 diabetics, keeping all users in the loop about care decisions to reduce stress and frustration.

a What I Learned

b What’s Next

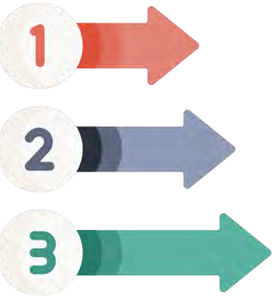
a What I Learned

Working on a project that I was so familiar with meant consciously working to overcome assumptions and biases. I had to learn to be very intentional and cross check my decisions as I designed solutions - “Am I solving this for my user or for myself?”

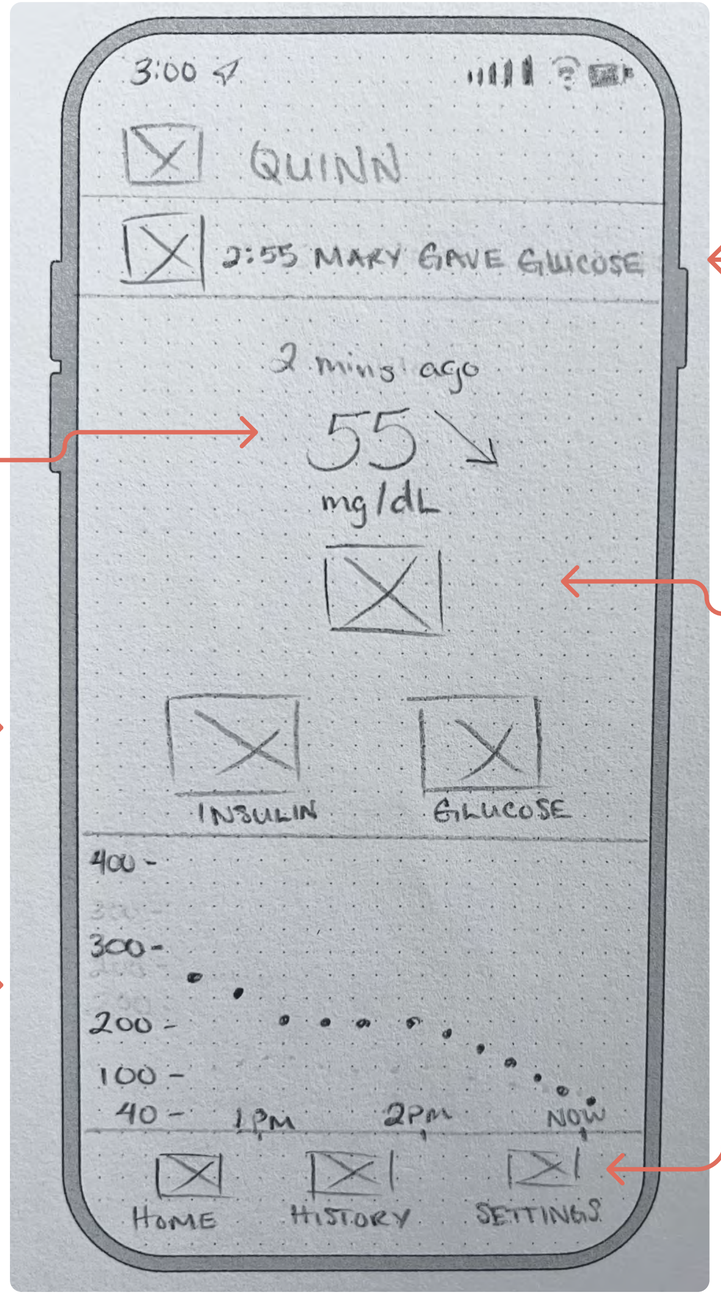
Focus on building the minimum viable product to see if it’s valuable. There is a litany of feature additions that could expand the target audience and provide more value but this project taught me how crucial it is to start with the minimum, gain user customer feedback, and iterate to shape the future of the product.

b What's Next

My goal is to take this to market.
What started as a conceptual assignment and a pain point that was personal to me led to the discovery of a true problem and a way to alleviate stress for fellow parents of type 1 diabetics, something I am deeply passionate about.
I'm not satisfied with this just being a fictional project. This is a real problem I have been complaining about for years and I am in a position to create a solution that could help my son and thousands of other families.



Realize this vision of what this could be.
There doesn't seem to be a product of equal value in the marketplace. I've identified 50+ people within my community who are eager for something like this but there are approximately 250,000 families across the country who could benefit from this product.
I am fortunate to have a partner who is an engineer and our spare time is spent working on passion projects. Next steps are to build it, start with a small group, test and determine if this product is truly viable.



Icon + text alert messages that stay on the screen so users can always see what and when the last care decision was

Real-time blood glucose data from Dexcom

This could be simplified more - not all users viewing the home screen need to make care decisions

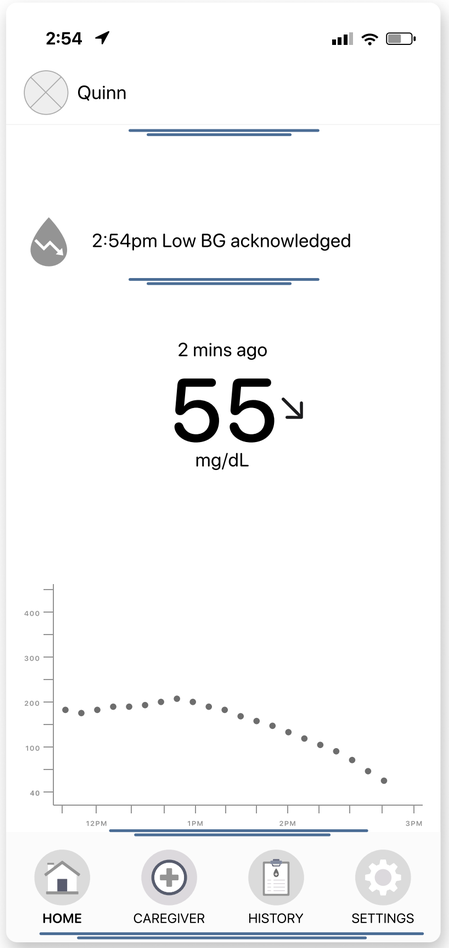
Large icons so users can quickly and easily mark care decisions

Graph of blood glucose history

Adding a 4th tab for 'caregiver' and moving Insulin and Glucose buttons might simplify the Home screen

UI Enhancements

Before Usability Testing



- Created more definition within the T1D profile
- Anchored the notifications to create hierarchy and reduce the feeling they they were floating
- Resized the graph and added threshold background colors for more visual contrast and ease of viewing data quickly
- Simplifyed the Tab Bar icons to reduce cognitive load

After Usability Testing