

# Understanding EMR Data & Maternal Experience

SERVICE DESIGN PROJECT

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bridgeable



This project was developed for **MaRS** as part of the **Bridgeable Pro Bono Program**. This program gives organizations an opportunity to tackle a business challenge or explore a market opportunity by using a design approach, without the financial risk of a paid project. Each year, we work with participating organizations on a design project to achieve meaningful progress on a defined challenge.

**Bridgeable** is a strategic design firm based in Toronto, Canada. Our multi-disciplinary team of designers, strategists, and researchers uses service design techniques to understand the world and create multi-faceted solutions that improve people's lives.

**MaRS** is where science, technology, and social entrepreneurs get the help they need. Where all kinds of people meet to spark new ideas, and where a global reputation for innovation is being earned, one success story at a time.

**Core Team**

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# Table of Contents

<b>4</b>	<b>EXECUTIVE SUMMARY</b>
8	About The Project
10	Prototype Summary
<b>13</b>	<b>RESEARCH</b>
14	Research Methodology
19	Themes and Insights
28	Maternal Experience of The Early Years
30	Maternal Experience of Clinical Navigation
<b>39</b>	<b>DESIGN PRINCIPLES</b>
<b>43</b>	<b>CO-CREATION</b>
44	Workshop Objectives
46	Workshop Process
48	Workshop Outcomes
<b>53</b>	<b>PROTOTYPES</b>
54	Prototyping Process
58	Prototype Description
62	Solution Journey
64	User Flow
<b>75</b>	<b>DESIGN RATIONALE</b>
<b>97</b>	<b>MOVING FORWARD</b>
98	Future Areas for Exploration
100	Tools and Deliverables
102	Solution Map
<b>105</b>	<b>ABOUT THE TEAM</b>

# Executive Summary

## BACKGROUND

Every year, a team of three bright interns are selected for Bridgeable's Designership. The Designership gives organizations an opportunity to apply a design approach, and achieve meaningful progress on a defined challenge.

The task for this year's interns was a bold one - how can we change the way Ontarians access clinical health information? Undaunted by the challenge, the interns, Elinor Keshet (Researcher), Stewart Dowdall (Strategist), and Cheryl Li (Designer), worked closely with MyHealth to define the first phase of their long-term provincial initiative to change the way Ontarians gain access to their clinical health information. To date, Ontario is working to standardize EMRs and is exploring new ways to make data available to the over 15 million people in the province.

## OUR CHALLENGE: CLINICAL DATA

The challenge was to **look at the intersection of data from Electronic Medical Records (EMRs) and information being tracked by moms in the first 24 months**. On the one side, you have a population that is increasingly tackling health data using technologies such as Fitbits and Apple HealthKit. On the other hand, you have a detailed set of clinical data being generated by healthcare practitioners inside Electronic Medical Records. We explored questions such as:

- What EMR data is most relevant to moms?
- How would data entry and sharing look like?
- How does "personal" data and "clinical" data work together?
- How is this designed in a way that is attractive and usable?

The team worked their magic over four months to create a service that would connect new mothers with their child's clinical and personal health information. The resulting service is called BabyBundle.

## OUR SOLUTION: BABYBUNDLE

**BabyBundle is a suite of apps to help moms better manage their child's health and well-being, as well as their own.** Its three core features include: tracking and summarizing data, gaining access to their child's health records, and sharing information with different caregivers and doctors in their child's circle of care. We developed a whole ecosystem of tailored solutions that focus on consolidating a baby's health information, giving moms an at-a-glance view of their child's health and wellbeing. Our aim was always to understand moms and translate something that would have a lasting and meaningful impact in their lives.

## USER-CENTERED DESIGN: OUR PROCESS

At the beginning of our journey we invited fifteen mothers to the Bridgeable office to explore the value of clinical health information in their lives, where they have interactions with health data and the health system, and what those pivotal moments look like. Amidst babies playing (and sometimes crying), moms shared their stories and experiences, and we listened.

**What we heard was that mothers did not feel a sense of control over their baby's health and wellbeing, or in navigating the health system in general.** The underlying issues were rooted in what was lacking in the system – **convenience** in accessing health information, **consistency** in what the health information tells them, **credibility** in the source of that information, and **contextualization** in the way the information displayed. These 4C's moved with us throughout the design process, serving as the anchor for our design solution.

**The team's goal was to design solutions that would help mothers feel in control of their child's health and wellbeing.** We invited moms to share their needs and desires with health innovators and healthcare professionals (HCPs), and work collaboratively with them to design prototypes that would address a specific gap or need. Putting mothers, HCPs, and innovators in a room together where they could listen to one another's needs was an inspiring and energetic experience for the design team. The day was filled with insightful dialogue that centered around three scenarios that had been identified as top of mind concerns for mothers during earlier research.

Through co-creation, the design team identified three creative concepts from which to build a solution, as well as three major insights into what control looks like to mothers. As a result, we came to realize that our solution had to centralize data, be flexible and provide actionable messages.

Over the final two months, we entered into a very rapid cycle of prototyping and iteration with the concept. We asked over a dozen moms to interpret our ideas and prototypes in our office, in waiting rooms, and occasionally in their own homes. This gave us the chance to discover problems early on and continuously adapt.

## FUTURE IMPACT

The response from mothers was positive and encouraging. They felt empowered at the thought of regaining a sense of agency and ownership of their baby's overall wellbeing. We are confident that there is an immense amount of hope and interest with the future of open data and can't wait to see what MaRS does next with MyHealth.



Elinor Keshet  
*Researcher*



Stewart Dowdall  
*Strategist*



Cheryl Li  
*Designer*

“

Every time you can get a little bit more confidence it goes a long way - especially when you're a new parent, or first time parent, or a parent encountering something that you haven't before. There's so much questioning, insecurity, and anxiety, so being informed gives you this platform to stand on. Things change so quickly.

**The next time we  
have a kid if there's  
something like this, it  
will be a completely  
different experience.”**

—MOM, VALIDATION SESSIONS

*Executive Summary*

# About the Project

## CONSUMER E-HEALTH INNOVATION PLATFORM

Bridgeable and MaRS are working together to build out a platform for one of five use-case scenarios: healthy moms and babies (0-24 months). The solution will give moms the opportunity to better manage their own health and their baby's health by pulling health information and clinical data into a readily accessible format. This report summarizes the application of a human-centered, service design process and its outcomes.

## ABOUT MYHEALTH

eHealth Ontario, with the help of Ontario MD, is transitioning paper patient files into Electronic Medical Records (EMRs). Province-wide implementation of an EMR system may be several years away, but conversations are ongoing about how technological innovations can improve access to personal health information and empower citizens.

MaRS's MyHealth project (known going forward as the Consumer e-Health Innovation Platform), will bring together clinical and non-clinical data to facilitate new paradigms for citizen interaction with their health information.

## OUR GOALS WERE TO:

- 1 Understand**  
The interactions moms with newborns from 0-24 months have with health information and health care practitioners.
- 2 Identify**  
Potential intervention points where the Consumer e-Health Innovation Platform can provide value for mothers through addressing their pains and desired gains.
- 3 Translate**  
Translate mother's needs and desires into a proof-of-concept that represents a system of solutions that capitalize on the Consumer e-Health Innovation Platform



*Executive Summary*

# Prototype Summary

## **BabyBundle**

BabyBundle is a suite of apps to help moms better manage their child's health and well-being, as well as their own.

### **ONE CENTRALIZED APP**

Moms are juggling a million things so BabyBundle does all the work for them. Moms can access all of their child's personal and clinical information in one place. BabyBundle also grows with moms, letting them customize the individual tracking apps they use throughout pregnancy, labour, a child's first years, and beyond. With the suite of smart products, data entry is made even easier.

### **ACCESS CLINICAL HEALTH RECORDS**

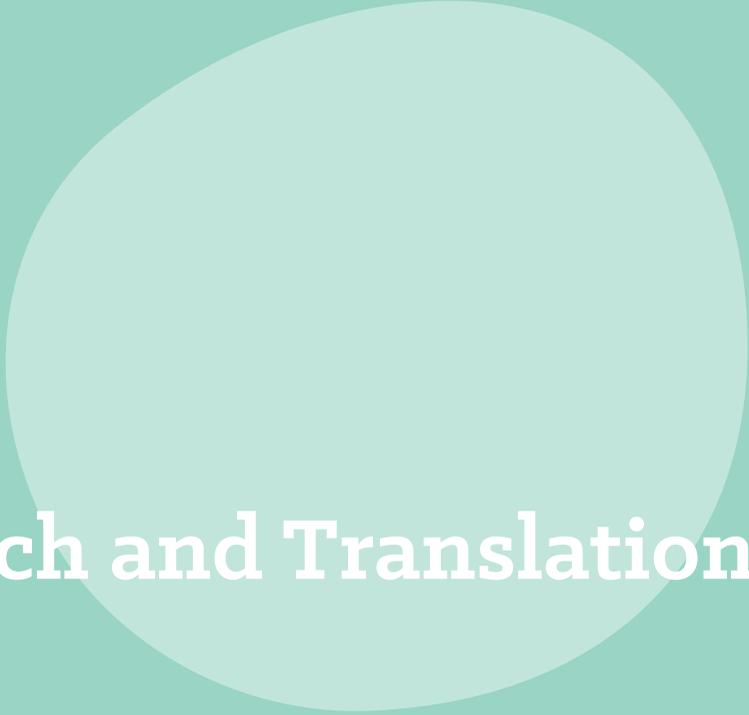
Using BabyBundle, moms can view information like their child's allergies, current medical conditions, appointment notes, lab results, prescriptions, immunizations, and more.

### **SHARE WITH CIRCLE OF CARE**

BabyBundle acknowledges that a mom knows her child better than anyone, but that she can't be everywhere at once. Mom can keep different caregivers and doctors in the loop by sharing information directly from the app. She controls what information to share, and when to share it.







# Research and Translation

- 14 Research Methodology
- 19 Themes and Insights
- 28 Maternal Experience of The Early Years
- 30 Maternal Experience of Clinical Navigation

*Research and Translation*

# Research Methodology

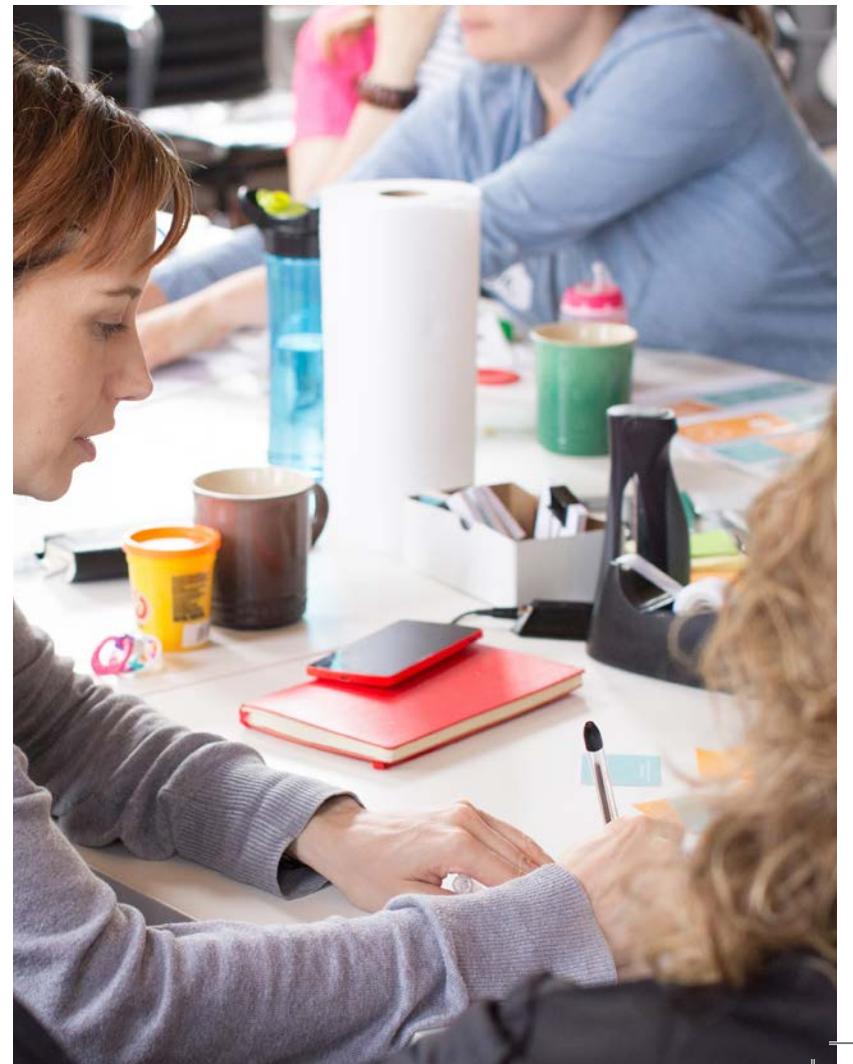
Human-centered design research involves looking to the user to define their needs. The Bridgeable team used a combination of ethnographic research methods to learn about the value of clinical health information in the lives of mothers, where mothers have interactions with health data and the health system, and what those pivotal moments look like. These objectives would provide a strong foundation to design a solution that would be meaningful and impactful for mothers.

Participatory  
Sessions

In-home  
Visits

Clinician  
Interviews

Case  
Studies





Maternal Health Experience  
Participatory Research Session

High Priority



sleeping patterns



riority



weight

Low Priority



immunization



diet



# Maternal Health Experience

Participatory Research Session

bridgeable

N/A

N/A

alth

Session

skin appearance

judgment

In/a

In/a

subject as high priority, medium

## PARTICIPATORY SESSIONS

Fifteen moms were invited to attend one of three participatory research sessions. **Through these sessions, we sought to understand what challenges, needs, and priorities arise during the first twenty-four months of motherhood and explore the wide network of people with whom moms interact.** These sessions were clinically focused, eliciting dialogue around the health system, health care, and the information available versus the information desired.

We designed two activities to elicit ideas and generate dialogue about what health related topics are top of mind for moms and with whom they would feel comfortable sharing sensitive personal health data. Through discussions and one-on-one interviews, we familiarized ourselves with the needs of new mothers and gathered fresh and in-depth insights about the interactions they had with the health system.

These sessions were intended to be the first step in understanding the user's needs. Given our scope and the limited timing of the project, it was important that participants felt comfortable answering questions in English and that they were technologically literate. For these reasons many of the moms who participated in our project were in the middle-upper income bracket.

## IN-HOME VISITS

After our participatory sessions, we followed up with mothers who were interested in continuing the conversation. **By visiting them in their homes, we were able to observe a more complete picture of their lives.** We had the chance to speak with their partners and see firsthand how busy and complicated parenting a young one can be. These interviews gave moms a chance to share journals, photos, and other artefacts with us, providing a layer of additional context to their stories.

## INTERVIEWS WITH CLINICIANS

After hearing compelling stories from moms about their interactions with healthcare providers, we spoke with five different clinicians—a general practitioner, a pediatric physiotherapist, a midwife, an OB/GYN, and an emergency physician—to hear their perceptions of our insights. **These conversations provided additional context for health related concerns we heard from mothers, the flow of information/data, and the complexity of coordinating care with multiple practitioners.**

## CASE STUDIES

Throughout the research phase, **we looked to a variety of health-related and non-health related analogues and case studies to gather inspiration.** Further research was done to understand the capabilities of EMR systems in Ontario, relevant guidelines and policies, and to familiarize ourselves with the features, benefits, and pitfalls of similar projects.

“

You just want to know everything; you want to know as much as possible and **you want to be in control of that information.**”

- MOM, PARTICIPATORY RESEARCH SESSION

*Research and Translation*

# Themes and Insights

Mothers don't feel in control of the health and wellness of their child, or in navigating the health system.

After the research sessions, we immersed ourselves in the stories we heard. Surrounded by cut-outs of transcripts, and post-it notes with our raw thoughts, we gradually started to translate the findings into themes and insights. The core theme uniting all the stories was that of control: mothers do not feel in control of their children's health information, or in control when navigating the health system in general. Instead, feeling that they were on their own to make sense of information that would affect how they manage their children's health.

On the flipside however, there was a strong desire to regain a feeling of ownership and stay 'in the loop' with regards to their children's health and wellness. We identified four major factors that contribute to this lack of control: convenience, consistency, credibility, and context of information. These four themes, and the insights that follow, served as an anchor for our project, guiding the design and development of BabyBundle.





3 Mothers want convenient access to all their health information in one place.

Moms find that there are many occasions where immunization records, feeding and sleeping records, growth charts, and other important data are not conveniently accessible to them. Moms expressed interest in being able to view, download, and share their baby's health information as needed.

*"For sure we lost Jackson's yellow card. We found it underneath the counter covered in juice one day because we didn't really have a place for it."*

*"I'd like to keep it all in one spot because when it's all over the place, you lose track and you become disorganized. Then when you get questions from their pediatrician or their health care provider, you can pull it all up in one spot."*

## Consistency

The ability for information to demonstrate a unified message

4 Mothers find it difficult to find reliable information because Internet sources offer a sensationalized view that is hard to trust.

Moms tended to agree that most blogs and Facebook groups are not the right places to find reliable, evidence-based advice for health and wellness concerns. While some resources were helpful, it was overall very difficult to find a source they could trust.

*"There's not really a reservoir for finding reliable answers. I don't want to read the blogs because they're scarier [...] they're always the worst case scenario."*

*"There is an overabundance of contradictory information [...] There are so few places you can go for evidence-based, non-anecdotal advice on different techniques [for sleep training]."*

“

I don't feel as though I'm in control of the information that the neonatal clinic has, and the information that [my child's] pediatrician has, because they're two separate institutions.

**You rely on those two institutions to connect and share information.”**

- MOM, PARTICIPATORY RESEARCH SESSION

5

### Gaps between health care providers can cause important information to be lost in translation.

Moms are often the conduits of medical information between their baby and health care practitioners. However, they still rely on practitioners to properly coordinate care especially when multiple practitioners are involved. Moms expect doctors to share vital health information with different care providers as needed, but instead, the burden is placed on moms to relay it.

.....  
“You’re just crossing your fingers and hoping that [they remember not to prescribe something that they’re allergic to].”

6

### Mixed messages from different health care providers give moms anxiety and make it harder for them to make decisions.

Moms have to keep track of a lot of information, and when different providers give them contradictory advice they question who is trustworthy. Situations where a provider gives information or advice that is incorrect or unfounded can leave moms feeling anxious.

.....  
“We felt as though we were being judged pass or fail as a parent, which really wasn’t fair. Then we had one of the neonatal doctors come in to speak with us after the occupational therapist left, and she was a much more calming voice in saying that this is not judgment and it’s not really a pass or fail, we just want to see what milestones Jack is hitting so that we can be sure that he is somewhat on track for his age group.”

.....  
“You get these really mixed messages – if you tell the doctors that you’re sharing a bed with your child at night they tell you that you may as well let your baby sleep on a bed of knives, or that you’re a horrible mom. There are safe ways of doing it [but they don’t tell you that].”

## Credibility

*The ability for information to come from a reliable source*

### 7 Doctors are credible sources for medical information, but not for experiential support.

Moms trust doctors, but mostly for medical advice. With sleep schedules, breastfeeding, and other experiences unique to motherhood, moms feel doctors don't always have the experiential background to be helpful. If a doctor has not gone through what the mom is going through, it can be very hard to provide advice or information that relates to her experience.

*"For everything related to advice or sharing your experience, especially for feeding and sleeping, then mothers, your family, and online groups are at the top of the list. They can share what their experiences were and what they encountered, and it helps you."*

*"A doctor became low priority when it came to experiential questions."*

### 8 Mothers see online groups, blogs, and forums as credible sources for experiential support, but do not see them as credible sources for health information.

Although other moms and online sources are not the most reliable sources for clinical information, they can provide a lot of very helpful experiential knowledge. Hearing how other moms resolved issues with sleeping and breastfeeding can give moms the guidance and support they may not be getting from a health care provider.

*"There are different types of sleepers. With social media you can get someone who will tell you their child is the same type of sleeper and they'll say I've been where you are, I recognize those 'symptoms,' and here are some things you can try."*

*"For every ten answers that say it's okay, the scary one is the one you'll remember most and that's the one you'll play over in your head. Most of the time, the people who answer have no credentials, but I'd really like to deal with facts when I'm trying to find something out about my baby."*

“

My son had a reaction to medication when he was a baby and they said we probably shouldn't give that to him again because he might be allergic. I don't know what it was, I can't remember the name of it, and I don't know where to get that information. So it's there, in a digital file somewhere, **but I don't know how to get it.**”

- MOM, PARTICIPATORY RESEARCH SESSION

“

The first six months are when you're worrying the most, or you're paying attention to things the most. You want to record everything because it's all new and you want to remember because **you can't remember what happened two days ago.**”

- MOM, PARTICIPATORY RESEARCH SESSION

## Context

*The ability for information to be understandable and relate to specific concerns*

9

### Moms do not know how clinicians value data.

Because clinical usage of data can be opaque to moms, they often have little sense of what to track or whether what they are tracking is relevant. This can lead to worried moms over-tracking their baby's every move at one extreme, and tired moms not keeping track of anything at the other.

*"I was better at keeping track in the first weeks because I wanted to do everything that the hospital told me since I didn't know any better."*

*"The doctor asked me last week, how many pees he had in a day. So then I would religiously count pees for the next week."*

10

### Moms do not understand how doctors measure a child's development.

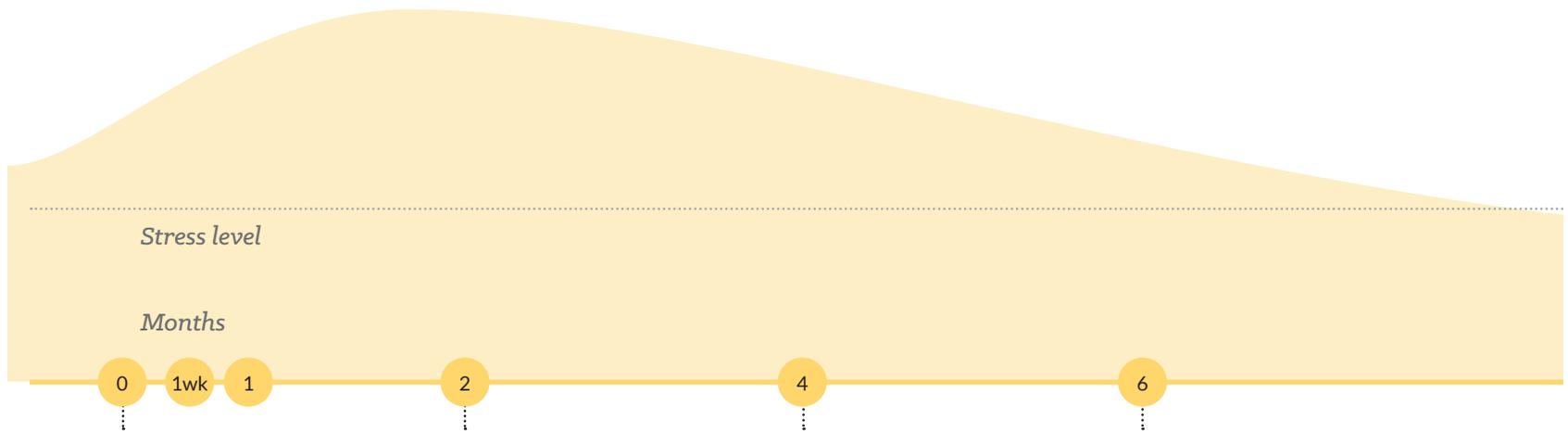
Developmental milestones are key indicators for parents to track the progress and growth of their child. However, the way that a doctor determines the success of each milestone is not being properly communicated to moms. Since moms see these milestones as rigid, they tend to feel guilty and judged when their child is not 'hitting' them.

*"With milestones, it would be good to know what the doctors are thinking about."*

*"I think it would be helpful for parents' wellbeing and mental health to get a little bit more context around milestones. [...] They are set as this hard line and if they cant do something yet then they're somehow deficient. There's not a lot of context around that and it adds a lot of undue pressure on you and it's unnecessary."*

# Maternal Experience of The Early Years

This experience map demonstrates the journey of mothers in the first 24 months of their child's life. It draws attentions to their top of mind concerns, the tools and technology they use, and the people from whom they seek advice from throughout their journey.



## Top of Mind Concerns

### Mental Well-being (throughout)

"The first few months are very taxing. [...] It's very isolating, so talking about it with a lot of people becomes very nerve wracking because you might portray that you're [...] not a fit mother. Or you're finding it difficult when everyone else seems like they're doing it easy."

### Breastfeeding

"Everyone thinks it's easy, but it's not. You think it's the most natural thing,... But it takes so long and it's so frustrating"

### Sleeping patterns

"I really lost any perception of my own needs in terms of sleep because I was obsessed with how he was doing."

### Temperature and Fever

"I'm obsessed with checking to make sure he's not overheating or too cold. They tell you that for the first two to four months, if they get a fever you have to go straight to the hospital."

### Peeing and Pooing patterns

"In the first 3 months I was tracking every one of her pees and poos."

### SIDS

"Six months is such an important milestone because the risk of SIDS decreases by 90%. And so for the first six months you're on high alert. [...] There's a real sense of—you are keeping this thing alive and every little thing you do contributes to whether or not this baby's gonna make it."

## Tools and Tech

### Helpful

#### Charts from Hospital

"The hospital gave us a chart for the first few months and then we kept going a little bit after."

#### Tracking Apps: "Baby Connect", "Wonderweeks"

"Your child might not do it, and there are ten things he doesn't do, but there's one or two that he does, and I'm like, 'Okay! I'm happy with that.'"

#### Hotlines, ex. "MotherRisk"

"If there was a hotline that I could call for my recovery, I would have no qualms about being completely detailed."

#### Facebook Groups

"I am on Facebook groups. And the Facebook groups are super helpful because at least it's moms talking about it."

#### Books

"I was finding the books more helpful than the blogs because [...] I liked that there was actually no feedback."

### Not Helpful

#### Blogs

"I almost don't want to read the blogs because they're scarier. [...] They're always the worst case scenario."

#### Online search engines

"I know [Google] is not right, and it's not the best, but it provided me some relief and with lack of sleep and with no time, it was one of those things where I was fine with it."

#### Online Medical Websites

"Things that aren't helpful were WebMD, Mayo Clinic. [...] It's just so generic. [...] It's very clean medical advice, but it tells you nothing."

9

#### *Mobility*

“Can she stand? Can she sit? Can she balance sitting when she’s by herself? To me its just an indicator of overall health.”

#### *Feeding*

“Now that he’s older, and we switched to solids [...] and want to make sure that his feeding is okay.”

12

#### *Transitioning Back to Work*

“Your priority for the past year has been your child [...] You have to now focus on something else for eight hours a day.”

#### *Daycare*

“If it’s your first child, you’re somewhat terrified to leave your child with anybody because nobody is as good as you.”

18

#### *Language Development*

“From the clinical perspective, up to 18 months is important. Everything up until then is just muscular and physical, but 18 months is when you first identify language delays which could signify autism.”

24

## *Advisors*

### *Helpful*

#### *Yourself*

“I trust my gut, but I like having the information. I think that I trust it more. [...] I gather all the information and then I say, ‘This is the way we’re going to go.’”

#### *Midwives*

“I just felt really comfortable talking [to my midwife] about how I was doing day to day.”

#### *Other moms*

“I trust that information because they’ve done it, but I know it might not work for this baby because every baby’s different. I trust the information to try it.”

“The good thing is that you can get reassurance from other moms, but then like we were talking about, you will get the judgmental mom. [...] So then you do have to take that in with a grain of salt.”

### *Not Helpful*

#### *Family*

“Generation to Generation is so different, sometimes getting advice from your mom or grandma will be so different.”

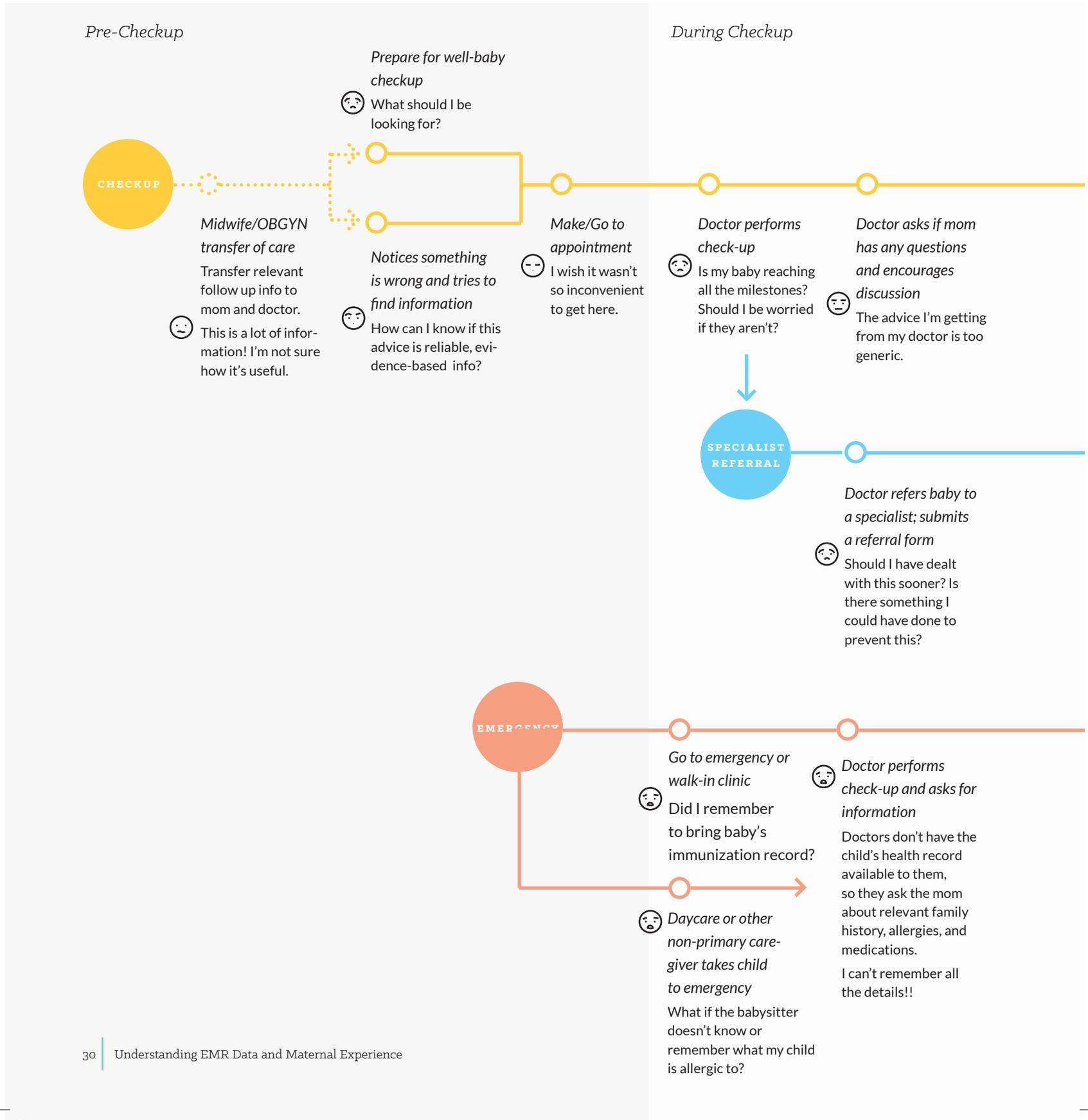
#### *Doctors*

“I found all the health professionals were very much skewed towards [breastfeeding] [...] They’ll say ‘oh you need a lactation consultant.’ But it’s like, ‘no hold on, that’s a choice I’ve made.’”

## Maternal Experience of

# Clinical Navigation

This experience map shows the different journeys a mother might take when interacting with the health care system, and what obstacles and opportunities arise from those encounters.



Mother's Feelings

 angry, frustrated

 doubtful, skeptical

 tired

 worried, anxious

 panicked

 relieved, happy

 confused, uncertain

Post Checkup

Next Checkup

*Baby's Doctor gives mom resources to look at and gives advice*

 I don't know if this is necessarily going to work for me. I'm not writing any of this down - I hope it's on file.

*Mother is extra vigilant and becomes worried about everything*

 I don't know what the doctor is going to ask me next time, so I'm going to just keep track of everything.

*Mom takes baby to see specialist*

Specialist takes a look at the referral form and completes the exam.

 Do they have everything they need on that referral form?

*Gets diagnosis and treatment plan*

 Is this the best option? Should I get a second opinion?

*Baby's health improves*

 How could I have prevented this?

*Baby's symptoms worsen*

 What is going on?

*Doctor doesn't have relevant information from baby's specialist*

 Aren't you guys supposed to communicate to each other?

*Doctors gives mom advice that conflicts with specialist's*

 Who am I supposed to listen to?

*Doctor examines child; sends child for diagnostic imaging and/or submits laboratory requisition to find out what's wrong*

 What if there's something I can't remember that would be helpful for the doctor to know?

*Wait for the results*

 Should I be doing something in the meantime?

# General Checkup Data Transfer

## Pre-Checkup

Prepare for well-baby  
checkup  
What should I be looking for?

1

### Midwife/OBGYN transfer of care

Transfer relevant follow up  
info to mom and doctor.

This is a lot of information!  
I'm not sure how it's useful.

Notice something wrong and  
tries to find information

How can I know if this advice is  
reliable, evidence-based info?

### Both mom and doctor receive:

- Antenatal Record
- Delivery Record  
(birth weight, length,  
head circumference,  
APGAR score, Standard  
Newborn Ontario Prick  
test, hearing, jaundice)
- Discharge summary  
(Doctor only gets if birth  
involved surgery or  
complications)

### Mom receives:

- Postpartum Information

## During Checkup

### Make/Go to appointment

I wish it wasn't so inconve-  
nient to get here

2

### Doctor performs check-up

Is my baby reaching all the  
milestones? Should I be  
worried if they aren't?



Specialist Referral  
see next page

### Doctor collects:

- Weight, Length, head  
circumference
- Breastfeeding or formula
- Stool and urine output
- Red eye reflex and corneal  
light reflex
- Hearing
- Skin (jaundice, dry skin)
- Immunizations
- Developmental Milestones

### Mom receives:

- Immunization Record

## Mother's Feelings

 angry, frustrated

 doubtful, skeptical

 tired

 worried, anxious

 panicked

 relieved, happy

 confused, uncertain

## Post Checkup

3

 Doctor asks if mom has any questions and encourages discussion

The advice I'm getting from my doctor is too generic.

### Doctor collects:

- Health concerns based on Rourke Baby Record/ Nippissing Developmental Screen

### Mom receives:

- Weight percentile

4

 Baby's Doctor gives mom resources to look at and gives advice

I don't know if this is necessarily going to work for me. I'm not writing any of this down - I hope it's on file.

### Mom receives:

- Chart to track child's inputs/outputs
- Information that addresses concerns and tells what to look out for.

5

 Mother is extra vigilant and becomes worried about everything

I don't know what the doctor is going to ask me next time, so I'm going to just keep track of everything.

### Mom collects:

- Baby's inputs/outputs
- Indicators that her baby is reaching/not reaching developmental milestones

# Specialist Referral Data Transfer

## During Checkup

## Post Checkup

1

Doctor refers baby to a specialist; submits a referral form



Should I have dealt with this sooner? Is there something I could have done to prevent this?

2

Mom takes baby to see specialist



Specialist takes a look at the referral form and completes the exam.  
Do they have everything they need on that referral form?

3

Gets diagnosis and treatment plan



Is this the best plan? Do I need a second opinion?

4

Baby's health improves



How could I have prevented this?

5

Baby's symptoms worsen



What is going on?

### Specialist receives:

- Relevant clinical information on a referral form

### Specialist collects:

- Results of the clinical exam
- Immunization record/information
- Request for other relevant health information not provided in referral form

### Both specialist and mom receive:

- Prescription information
- Treatment plan
- New referral (if applicable)

## Mother's Feelings

 angry, frustrated

 doubtful, skeptical

 tired

 worried, anxious

 panicked

 relieved, happy

 confused, uncertain

## Next Checkup

4

*Doctor doesn't have relevant information from baby's specialist*



Aren't you guys supposed to communicate to each other?

5

*Doctors gives mom advice that conflicts with specialist's*



Who am I supposed to listen to?

### Doctor receives:

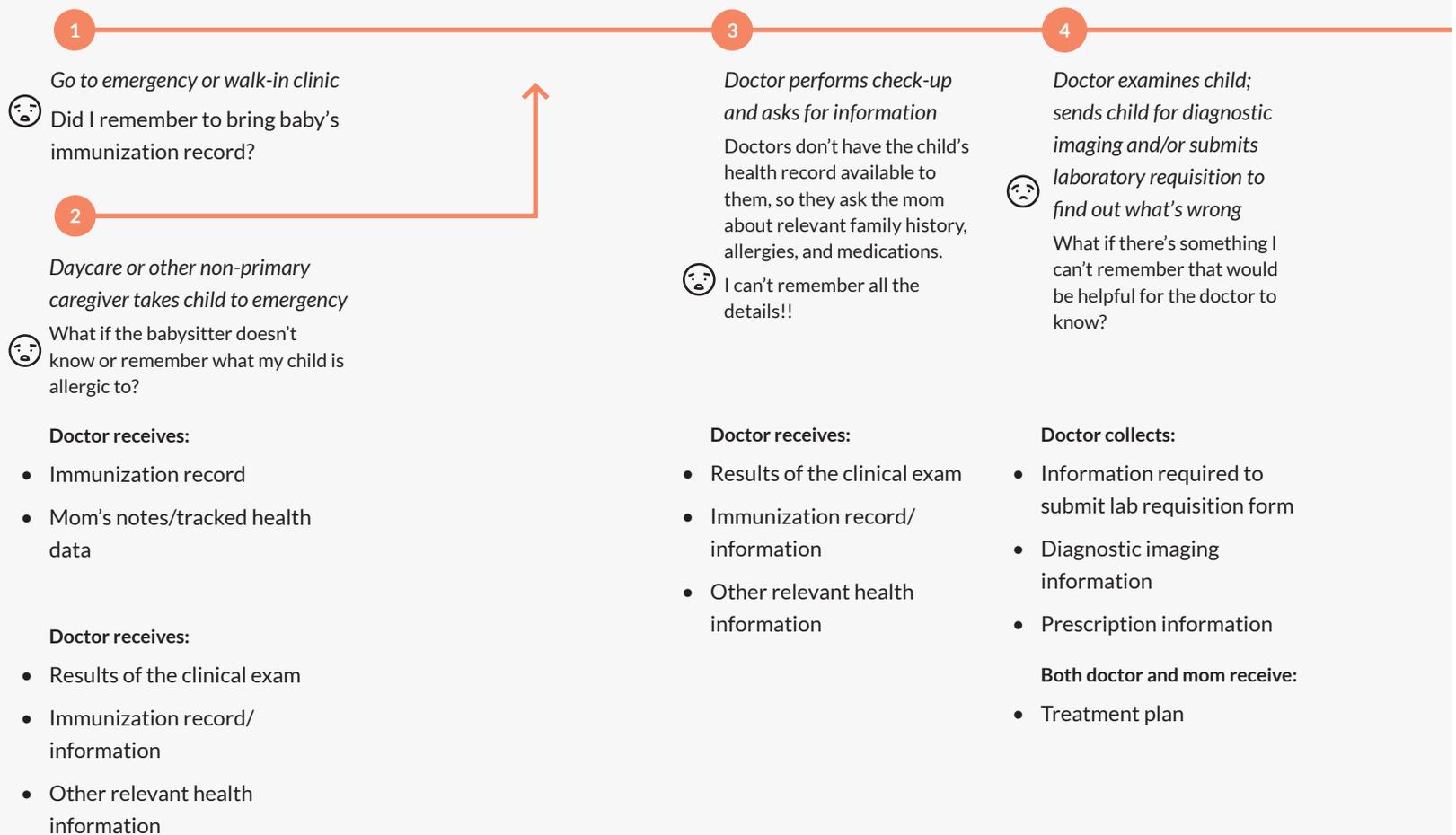
- Health information from mom's recollection or memory

### Mom receives:

- Treatment plan

# Emergency Data Transfer

## During Checkup



*Mother's Feelings*

 angry, frustrated

 worried, anxious

 relieved, happy

 doubtful, skeptical

 panicked

 confused, uncertain

 tired

*Post Checkup*

*Next Checkup*

5

*Wait for the results*

 Should I be doing something in the meantime?

**Mother receives:**

- Positive results through phone call (negative results do not require a phone call)

Gets diagnosis and plan for care

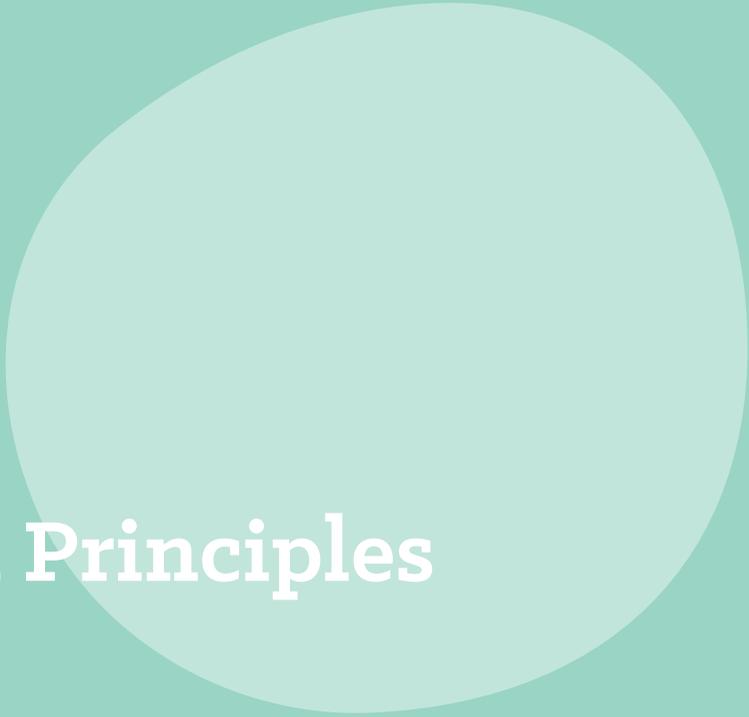
Baby's health improves

Baby's symptoms worsen

Doctor doesn't have relevant information from baby's specialist

Doctors gives mom advice that conflicts with specialist's





# Design Principles

# Design Principles

Design principles are statements based on research and are used to guide design work. They ensure that the features of what we design are always grounded in the main insights and objectives. The following are actionable principles that were developed from insights collected during the participatory research sessions we held with mothers. They can be adapted to develop solutions for citizens seeking access to health information.

## Our solution should provide *convenience* by:

- 1 Letting the device do all the work.**  
Moms are juggling a million things. Ensure that the service and platform is accessible through multiple channels so it can be integrated naturally into the day-to-day life of moms.
- 2 Acknowledging that one size doesn't fit all.**  
Give moms the ability to control how information is displayed and organized.
- 3 Creating a single snapshot of all health information.**  
Make it possible for moms to view all components of their child's health in one place

## Our solution should provide *consistency* by:

- 4 Letting moms decide who can see what.**  
Create a method for moms to not only view all clinical/non-clinical and self-tracking information in one place, but to control who can access it.
- 5 Providing tools to interpret what's hard to understand.**  
Give moms context and practical tools that help them make sense of information from different practitioners.

6 **Communicating flexibility.**  
Creating a consistent and sound sense of direction for moms that conveys flexible expectations.

7 **Using simple language and visual aids.**  
Using easy to understand language, examples, and visuals, moms will be able to discern what information is credible.

## **Our solution should provide *credibility* by:**

8 **Acknowledging that moms know their child better than any healthcare professional.**  
Provide a method for moms to log their concerns as they arise and incorporate relevant data they are tracking, so that they can communicate concerns as stories based on credible evidence.

9 **Bolstering social connections.**  
Provide access to networks and social systems that provide experiential support, reinforce healthy norms, and leverage reciprocity through peer-to-peer knowledge.

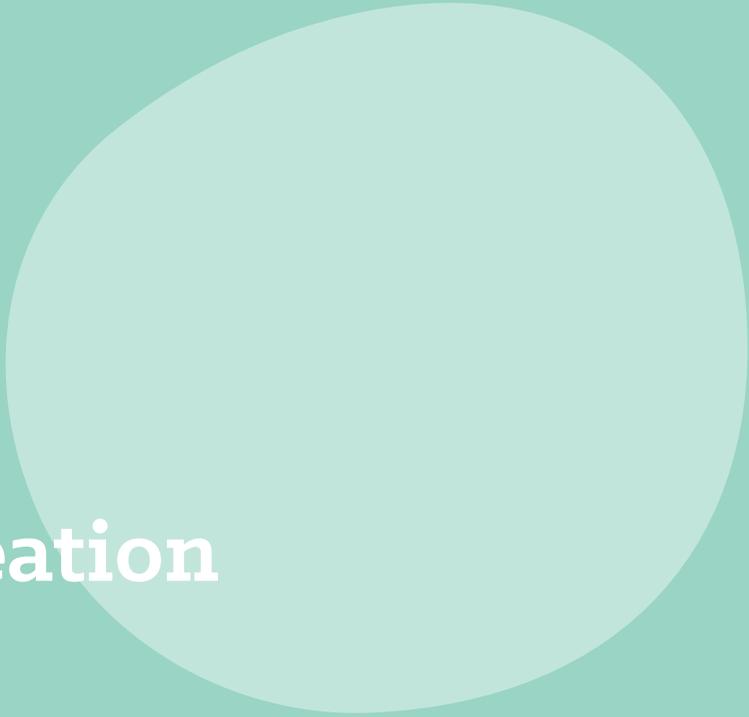
10 **Providing opportunities for real-time communication via trusted sources.**  
Moms will typically turn to Facebook groups and forums when they need information and advice immediately, sacrificing their need for credibility in lieu of real-time communication. Enable a system that promotes both these needs as a priority, creating a trusted and responsive tool.

## **Our solution should provide *context* by:**

11 **Explaining the purpose, intention, and rationale of information.**  
Create a picture for moms about what is useful information to collect/track/monitor, where there is flexibility, when it is useful to share it, and with whom they should be sharing it.

12 **Enabling monitoring and feedback.**  
Promote tracking tools that make it easier for moms to monitor changes in their baby's health, make note of patterns, and to schedule their lives around their baby's schedule.





# Co-Creation

- 44 Workshop Objectives
- 46 Workshop Process
- 48 Workshop Outcomes

Co-Creation

# Workshop Objectives

Co-creation is the beginning of the prototype process.

We invited moms to share their needs and desires with health innovators and healthcare professionals (HCPs), and work collaboratively to design prototypes that would address a specific gap or need. Putting mothers, HCPs, and innovators in a room together where they could listen to one another's needs was an inspiring and energetic experience for the design team. However, through collaborative discussion we uncovered three pivotal moments when mothers felt significant lack of control and where health information could offer guidance and support to mothers:

1

## TRANSFER OF CARE (DAYCARE)

Mothers often find themselves stressed when recalling all of the necessary clinical information that daycare and other caregivers need to take care of their child. This information can be hard to obtain, easy to misplace, or can get lost in translation.

2

## BREASTFEEDING

Breastfeeding isn't so simple, and many mothers find it difficult to breastfeed at the beginning of a baby's life. Mothers find themselves confused navigating the different feeding methods and philosophies suggested by others and lack tools that help them track their progress relative to their desired outcomes.

3

## MILESTONES

Mothers feel pressure to meet all the developmental milestones at each Well-baby checkup, perceiving them as uncompromising expectations rather than as flexible, healthy ranges. Mothers aren't certain how doctors measure the milestones, causing undue pressure and feelings of inadequacy.



Co-Creation

# Workshop Process

Through a set of carefully designed activities, our goal was to find out exactly what it looked like to regain control.

We used the analogy of cooking for a friend to communicate the objectives of the workshop. The groups worked together to develop three unique solutions to address the problems.



## LEARNING ABOUT YOUR GUESTS

Our research readout summarized our insights and gave participants the design principles to think about when creating solutions for mothers.



## GATHERING INGREDIENTS

Using inspiration cards with different concepts, participants were asked to pull features that would best address specific needs.





## COOKING

Using those features, participants assembled the ones that worked well together and would address their design challenge.



## TASTE TEST

Participants presented their ideas to each other for feedback and selected the one they felt addressed the gaps in their scenario best.



Co-Creation

# Workshop Outcomes

Working together, each group developed a creative solution to address their scenario

## TRANSFER OF CARE: SHAREABLE DASHBOARDS

An app that aggregates health data from wearables and allows mothers to share specific dashboards with their child's daycare or other caregivers within their child's circle of care.



## BREASTFEEDING: TRACKING COACH

A tracking app that monitors a baby's feeding habits and coaches mothers to support them during feeding. Since feeding is highly personal, the app is flexible and adapts to the mother's sometimes erratic use.



## MILESTONES: PERSONALIZED TIMELINE

A tracking app that creates a personalized timeline of milestones their child has hit and that are coming up. Milestones are shown in context with one another to get a bigger picture of a child's development.



Through co-creation, the design team gained three major insights into what control looks like to mothers.

### **CENTRALIZED DATA**

Having all relevant information easily accessible in one place is hard to do on your own, but extremely desirable.

### **FLEXIBILITY**

The information needs of each mother and child differ, and the best approach is to give moms the ability to personalize information and to support their decisions.

### **ACTION-ORIENTED**

In order to affect behaviour and actions, there are five stages - each stage building off the last.

- **Setting Expectations:** Knowing the rationale and purpose
- **Tracking Data:** Recording the information that is relevant
- **Understand Data:** Interpreting the data to aid in decision-making
- **Sharing Data:** Sending data that is valuable and useful for the mom and the recipient
- **Taking Action:** Making decisions that improve a child's health and wellness







# Prototypes

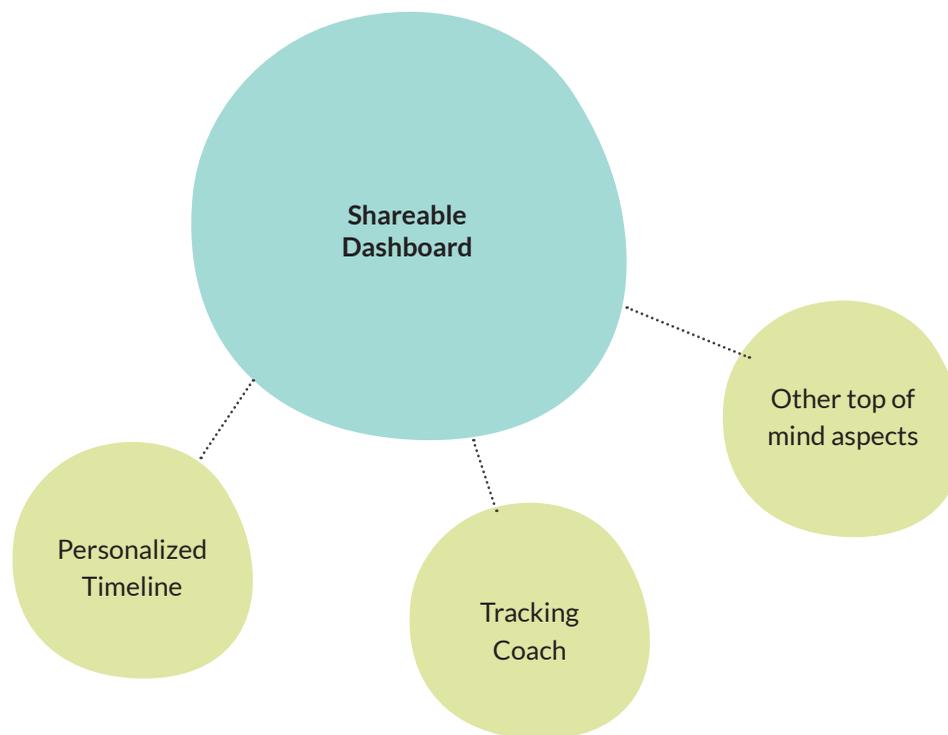
- 54 Prototyping Process
- 58 Prototype Description
- 62 Solution Journey
- 64 User Flow

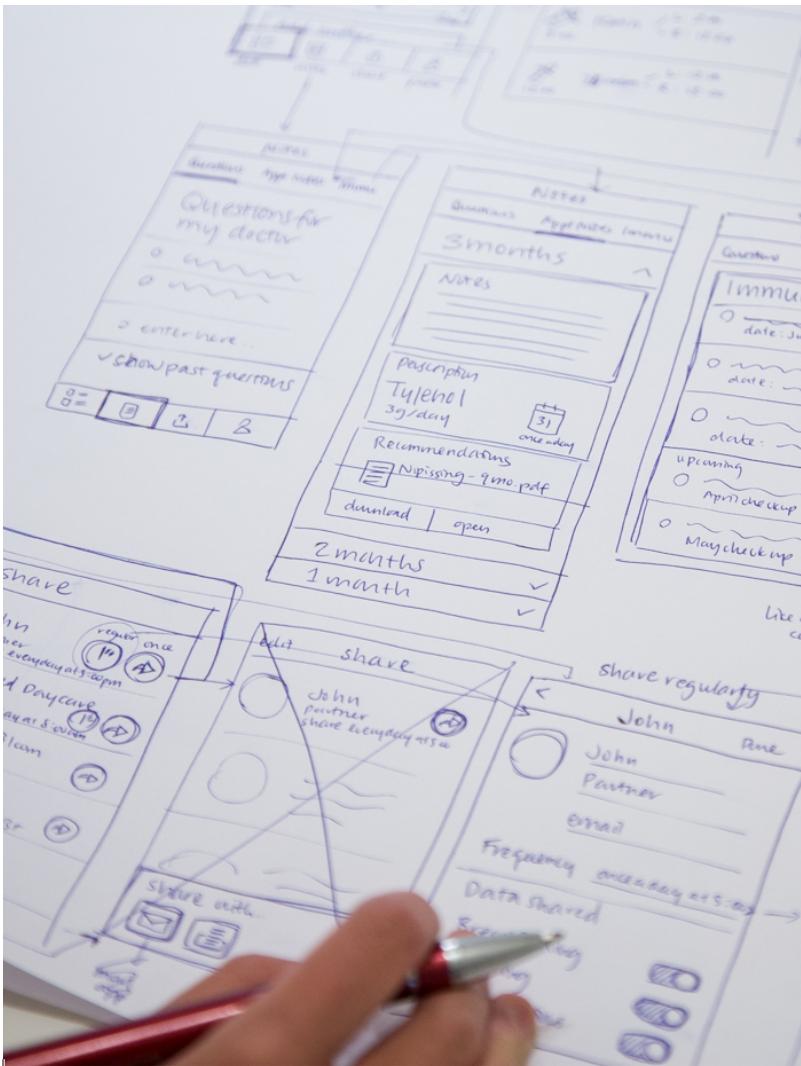
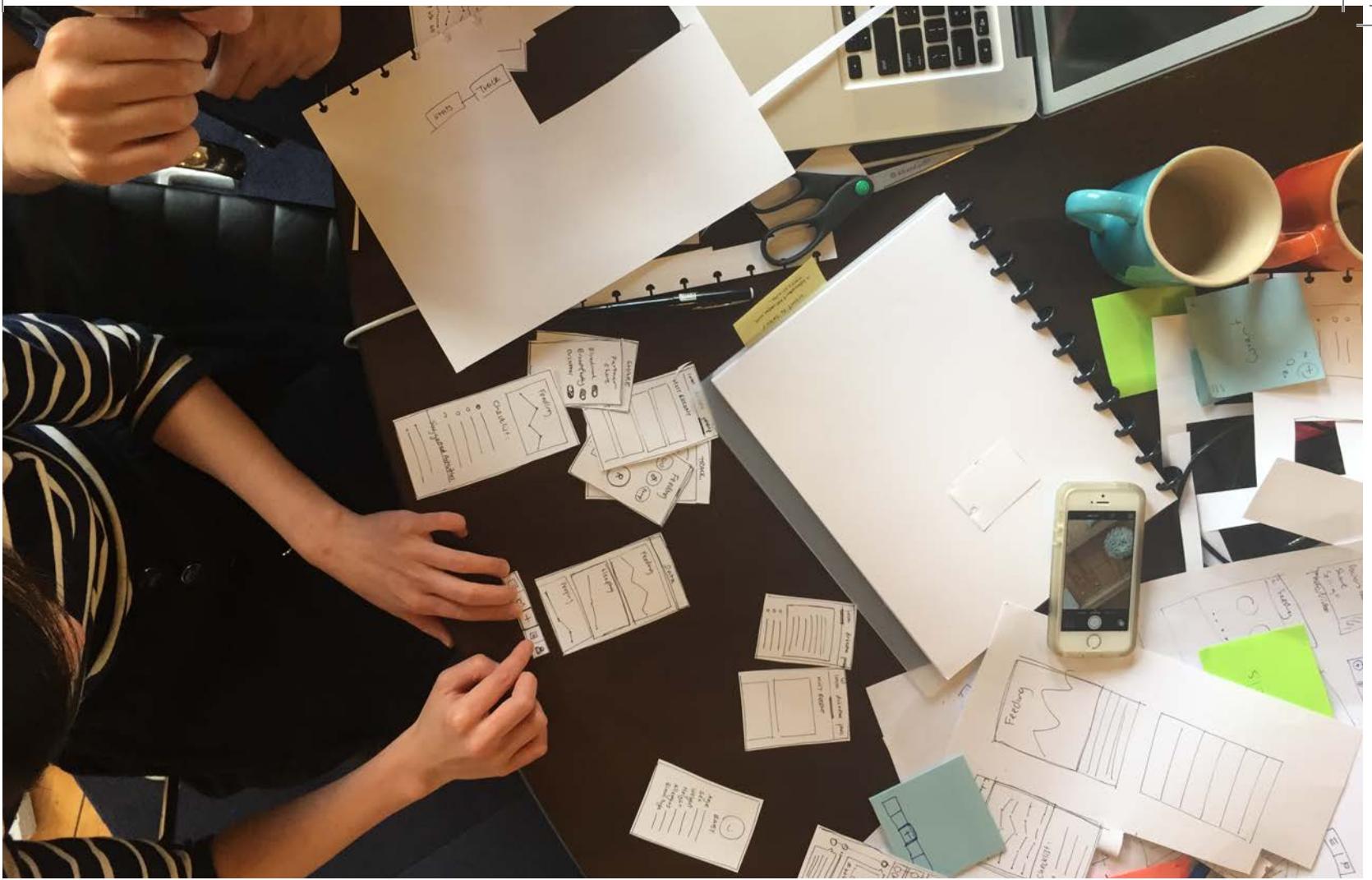
Prototypes

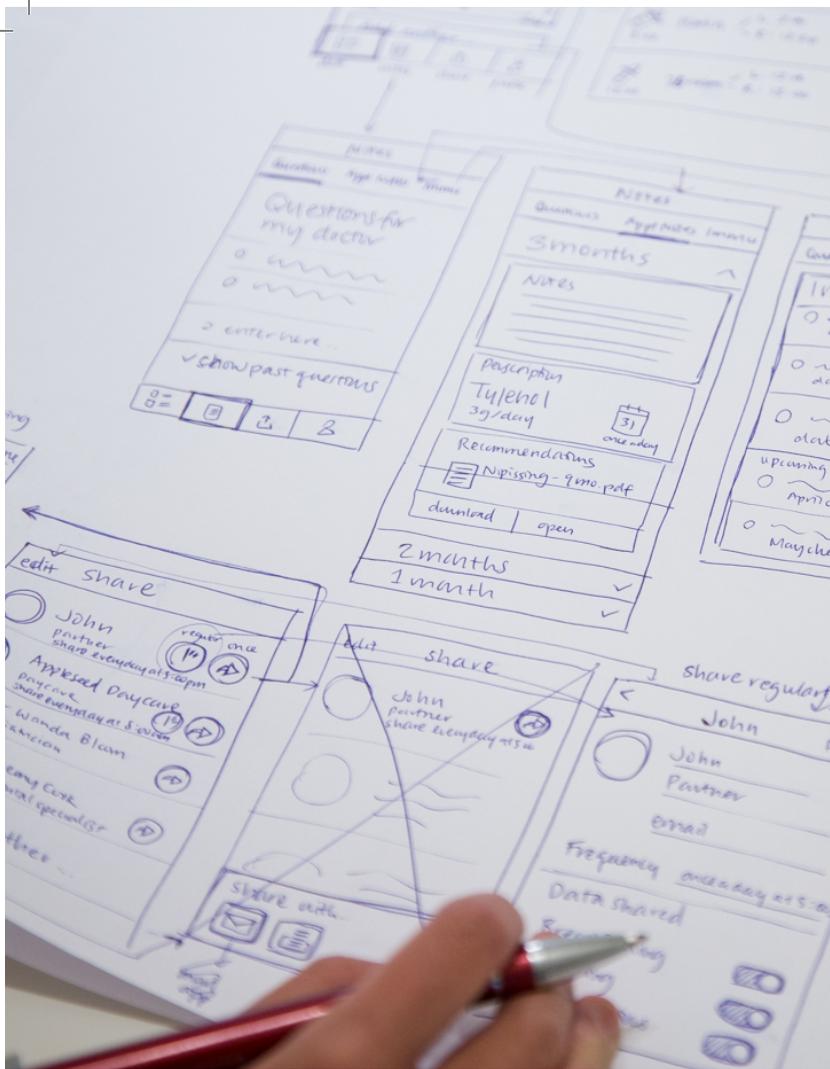
# Prototyping Process

Using the hypotheses from our research, and returning to our design principles, we refined the three concepts generated during co-creation so that we could bring our concept to life.

We wanted to maintain the three creative solutions from co-creation, but find a way to centralize them all. The result was to begin prototyping a 'Shareable Dashboard' that would now become the centralized hub for tracking information. That information could include important milestones, breast feeding reports, or many other aspects that mothers identified as important. These things would be flexible, and would grow and work with mothers over time.





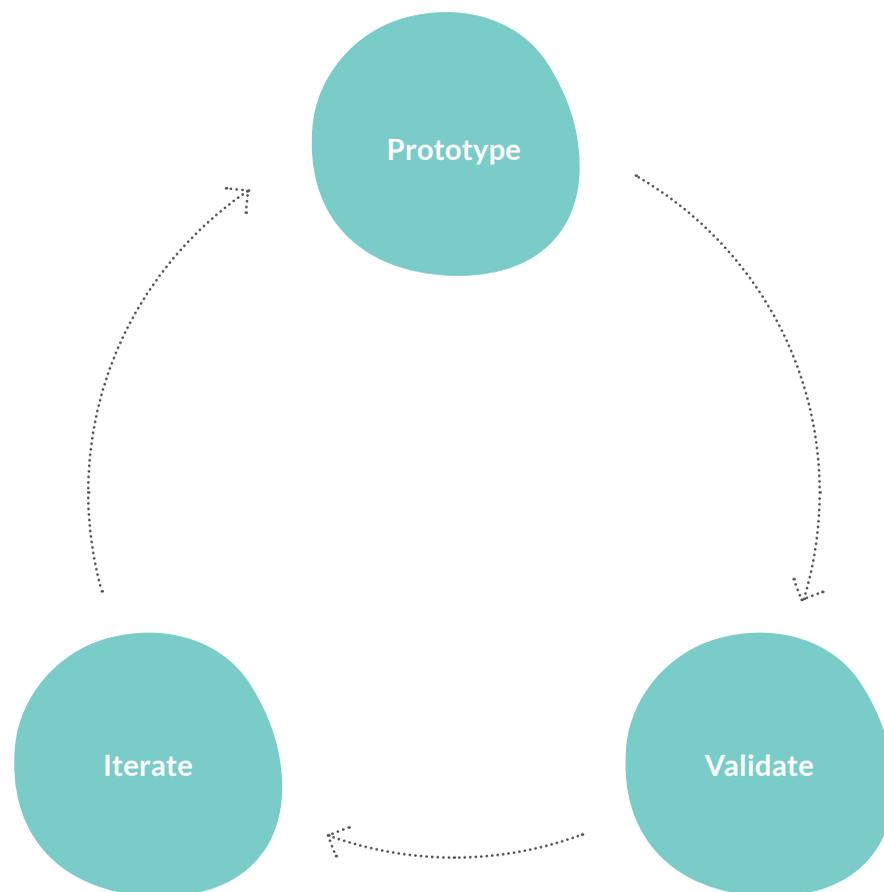


## ITERATIVE DESIGN THROUGH USER VALIDATION

Over the following two months, we entered into a very rapid cycle of prototyping and iteration with the concept. We asked over a dozen moms to interpret our ideas and prototypes in our office, in waiting rooms, and occasionally in their own homes. This gave us the chance to discover problems early on and continuously adapt.

We started early on with sketches and wireframes, and it didn't take long until we were presenting moms with an elevator pitch for BabyBundle and were using a clickable prototype to test our ideas for the service.

Mothers gave us plenty of feedback, but we also heard from dads, subject matter experts, and senior designers.



*Prototypes*

# Prototype Description

## BabyBundle

### CONVENIENCE

BabyBundle is a full service suite of apps that provides access to all of a child's health information in one place. Consider this: moms are writing down milestones in their phones, storing immunization records in a file folder, and keeping a list of allergies on the fridge. Meanwhile, their main priority is caring for their newborn and learning all the things that come with being a new mother. BabyBundle gives moms a sense of order and control by letting them manage all this information in one place and with the suite of smart products available, entering that information becomes even easier.

### CONSISTENCY

BabyBundle acknowledges that moms know their child better than anyone, but they can't be everywhere at once. We made it easy for moms to keep different caregivers and doctors in the loop by sharing any personal or clinical health information directly from the app. BabyBundle makes suggestions about what to share with each participant, but moms can edit that information as they like; it's up to moms to decide what to share, when to share it, and who to share it with.



Milk Metrics



Nursing & Bottles



Eating



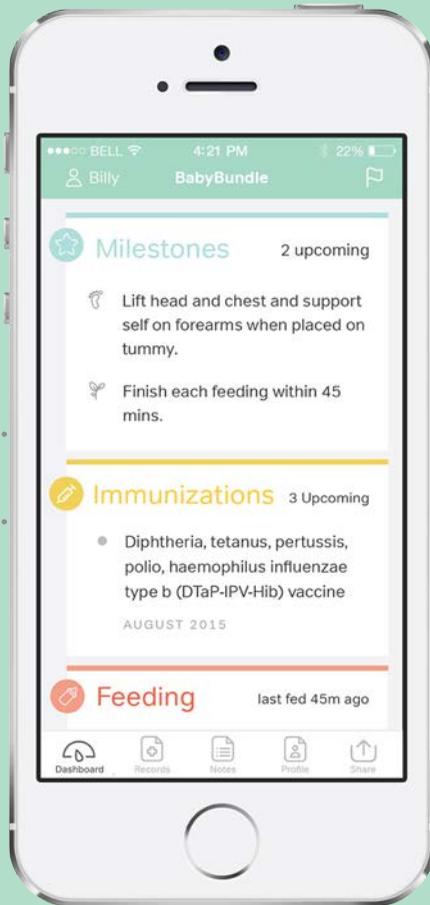
Diapers



Milestones



Baby Beacon



Smart Blankie

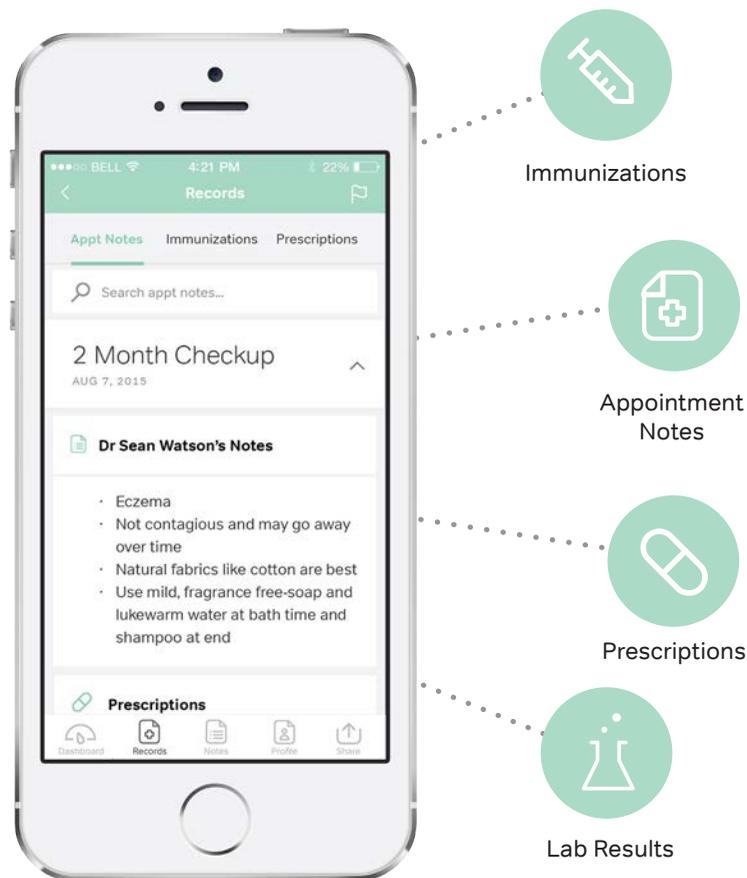


Passport App



## CREDIBILITY

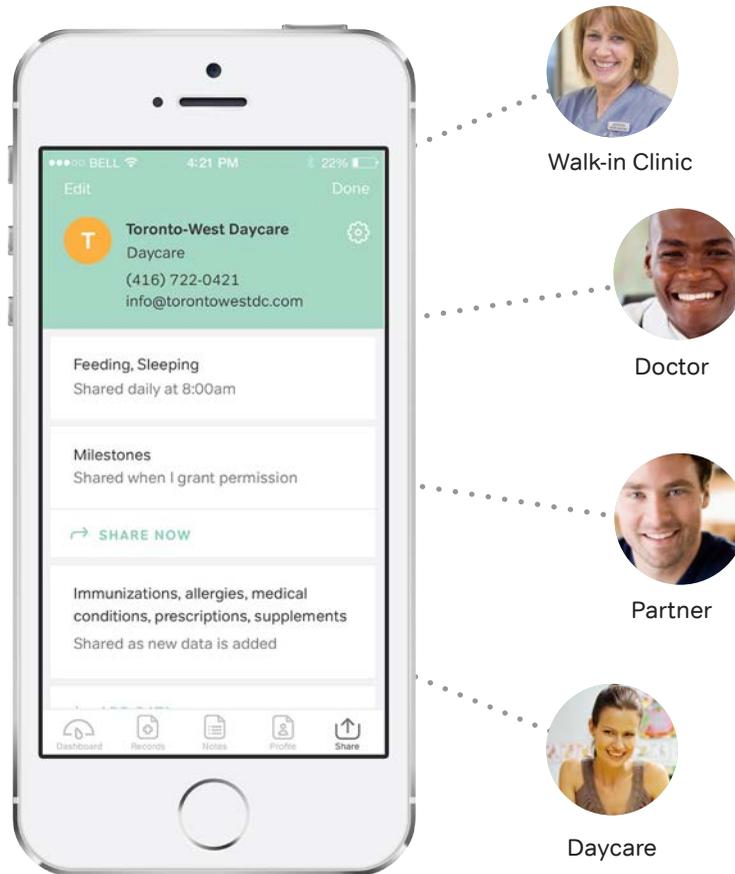
BabyBundle is a suite of apps to help moms better manage their child's health and well-being, as well as their own. It streamlines access to medical records, helping moms manage their child's health based on personal and clinical information, via any device. Moms can feel confident that they are well informed in any situation—be it visiting a new doctor, or registering their child for daycare. Having a wide range of health information at their fingertips gives moms a way to ground their concerns and questions in data, patterns, and past events.



## CONTEXT

BabyBundle makes suggestions to moms about what information is valuable to track. The app grows with moms by suggesting which trackers to download throughout pregnancy, labour, their child's first years, and beyond. Moms can download the trackers that are most useful and fit their needs at a given moment in time.

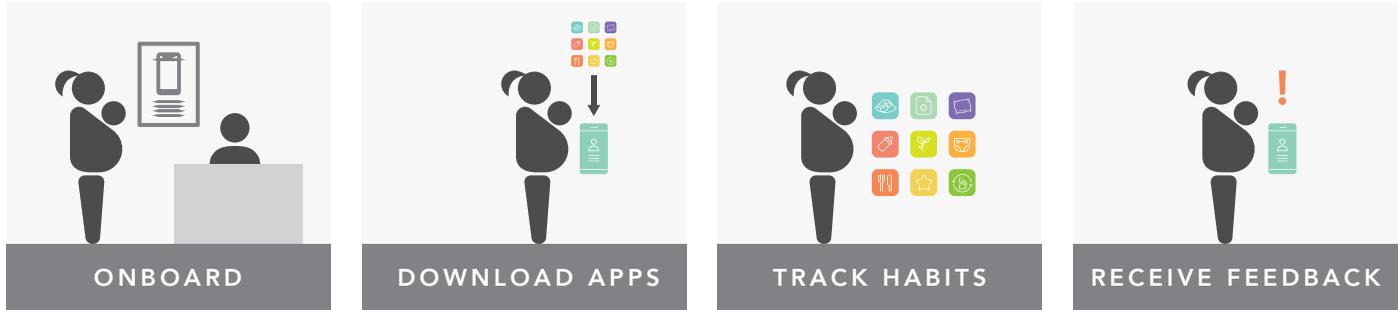
Notifications appear when significant time has passed since she last entered information. This notification also prompts her to decide if she is no longer using the app. Notifications may also suggest whether her baby is thriving, based on patterns and trends in the data. This feedback gives moms a feeling of relief, as well as feedback and recognition so that they can build confidence in their instincts. They can decide to keep the app or archive the information it's collecting.



Prototypes

# Solution Journey

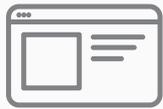
This Solution Journey Diagram outlines all the touchpoints that moms interact with during onboarding and use of BabyBundle. A variety of touchpoints in the clinical and personal context are required to make the desired maternal experience.



SETTING EXPECTATIONS

TRACKING DATA

PERSONAL ENVIRONMENT



Website

Website demonstrates value of service and instructs how to download and use apps.



Passport App

Mother downloads Passport App which suggests other tracking apps that can be of value.



Tracking Apps



Tracking Apps



Smart Trackers (Optional)

Mother uses tracking apps to keep track of her child's health and wellness. (Smart Trackers optional).



Passport App

Passport app coaches the mother's parenting style through alerting her of her child's progress.

CLINICAL ENVIRONMENT



Marketing Card



Marketing Poster

Admin refers Mother to MyHealth Passport and suggests tracking apps.



— UNDERSTANDING DATA —



**Passport App**



**Share Sheets**

Passport app shares baby's progress to healthcare provider via direct EMR transfer or share sheet.



**Passport App**

Mother takes notes and receives careplan through the passport app.



**Passport App**

Mother acts on careplan and takes actions that will improve her child's health and wellness.



**EMR with MyHealth Plugin**

HCP receives child's progress and uses that as a reference for diagnosis.



**EMR with MyHealth Plugin**



**Telehealth with MyHealth Plugin**

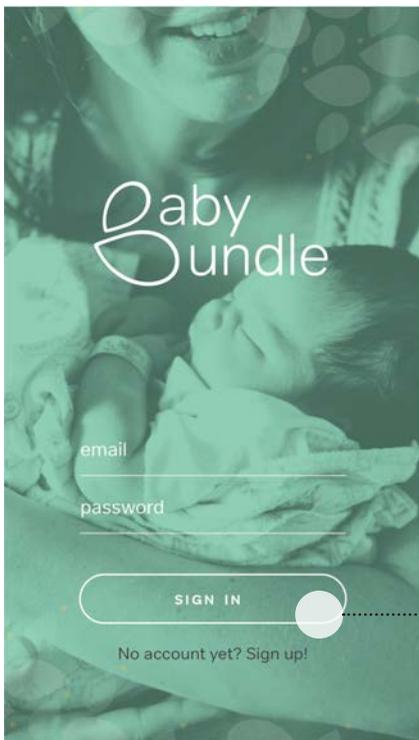
HCP gives mother careplan and prescriptions based on child's health.



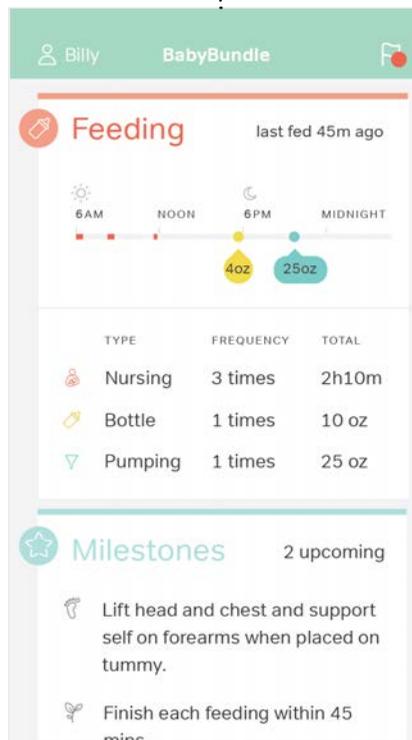
**EMR with MyHealth Plugin**

Pharmacy receives prescription and prepares medication for pick-up.

# User Flow Overview

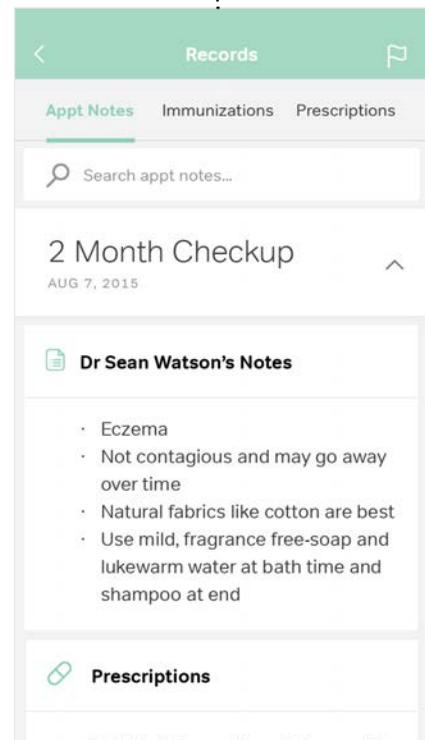


**Sign In**



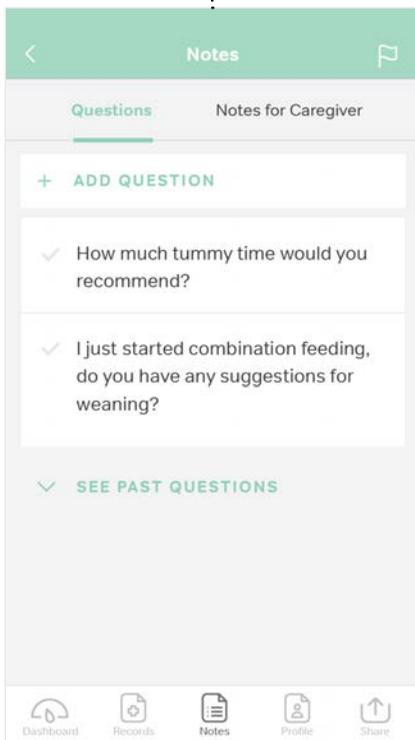
**Dashboard and Outputs**

page 66

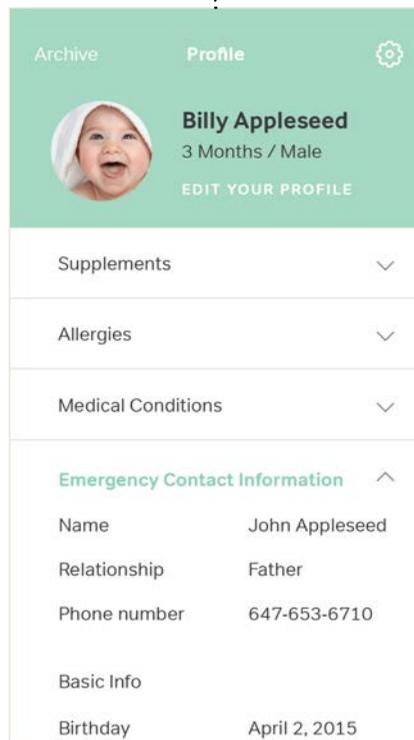


**Records**

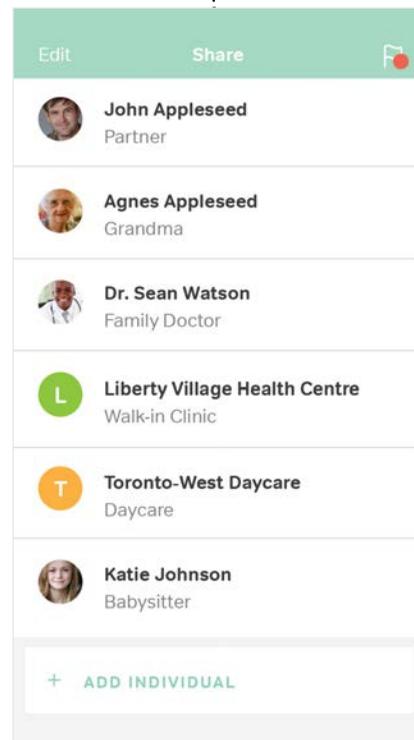
page 68



**Notes**  
page 70



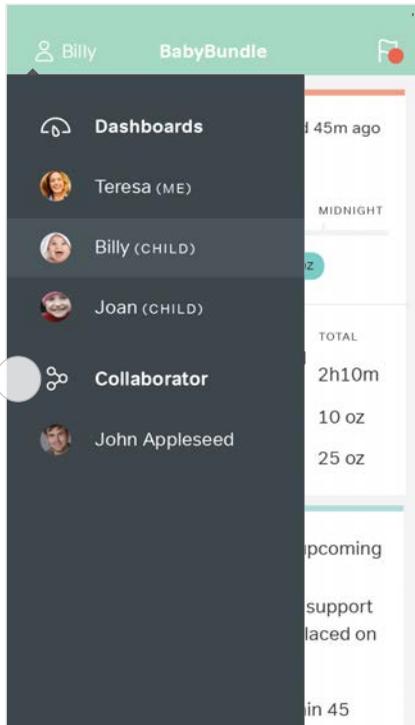
**Profile**  
page 71



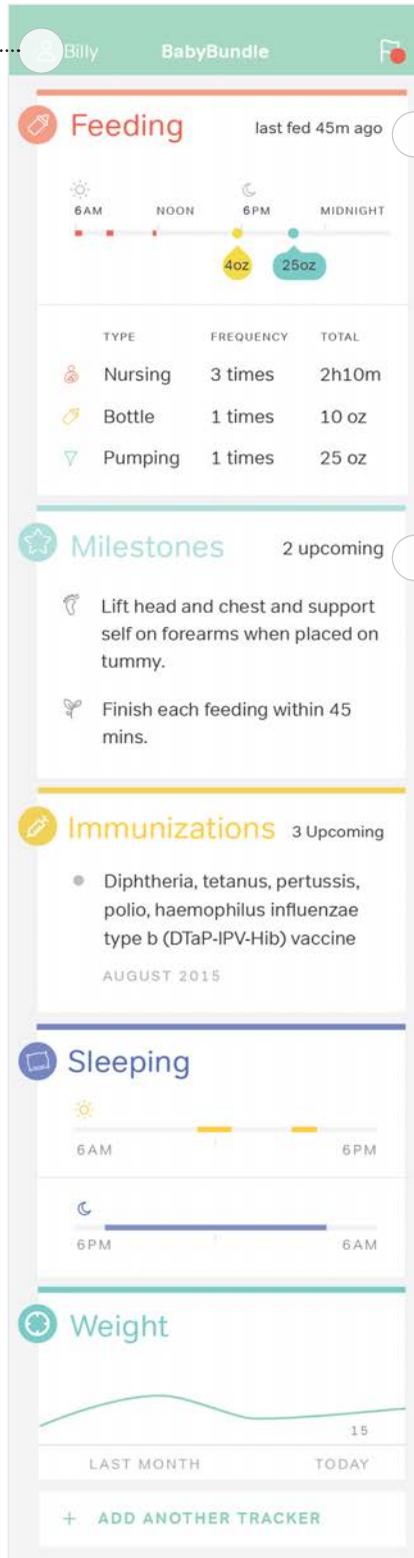
**Share**  
page 72

# User Flow Dashboard and Outputs

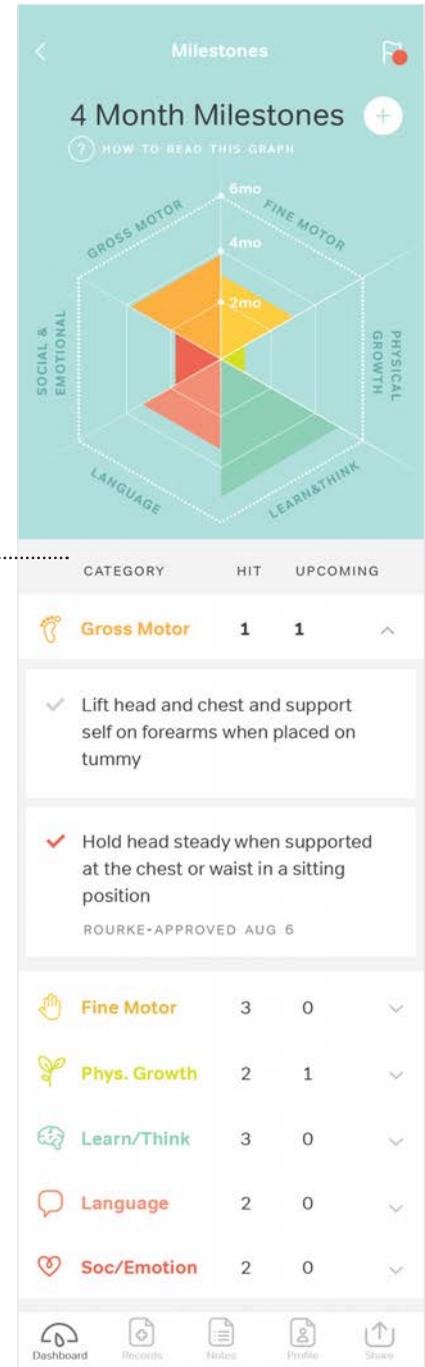
Main Menu



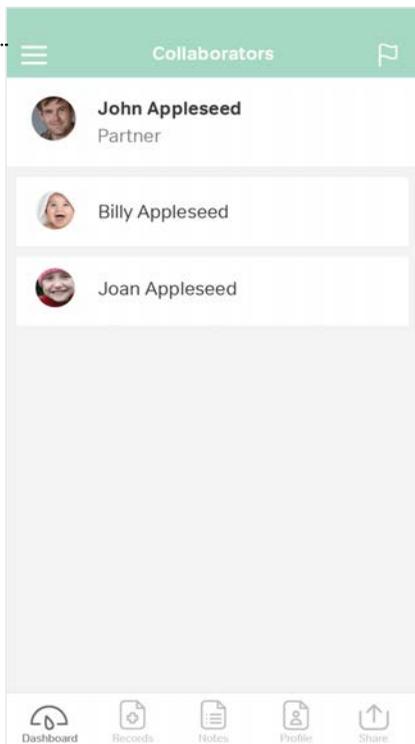
Dashboard



Milestones



Collaborator



Feeding

Daily ▼ 🚩

### Feeding Today

August 12, 2015

6 AM NOON 6 PM MIDNIGHT

4oz 15oz

**Nursing**

3 times TODAY 100/80 LEFT/RIGHT 180 TOTAL (MINS)

**Bottle**

1 time TODAY 4 oz TOTAL AMT

**Pumping**

1 time TODAY 5/10oz LEFT/RIGHT 15 oz TOTAL TODAY

#### Feeding Log

**Daytime**

7:05a  
**Nursing** 35 min L15 R10

10:04a (1h 59m since last)  
**Nursing** 20 min L10 R10

2:05p (4h 1m since last)  
**Nursing** 10 min L5 R5

3:01a (56m since last)  
**Bottle** 15 oz

**Night time**

7:01p (4h since last)  
**Pumping** 15 oz L10 R5

Dashboard Records Notes Profile Share

Weekly ▼ 🚩

### Feeding this Week

Averages based on your last week

**Nursing**

5 times PER DAY 30 min PER FEEDING 2.5h INTERVALS

**Bottle**

2 times PER DAY 5 oz PER FEEDING 10 oz TOTAL PER DAY

**Pumping**

1 time PER DAY 5/10oz LEFT/RIGHT 15 oz TOTAL PER DAY

#### Trends

minutes ounces

Th F S Su M Tu W

Dashboard Records Notes Profile Share

Monthly ▼ 🚩

### Feeding this Month

Averages based on your last month

**Nursing**

4 times PER DAY 25 min PER FEEDING 2h INTERVALS

**Bottle**

3 times PER DAY 5 oz PER FEEDING 15 oz TOTAL PER DAY

**Pumping**

2 times PER DAY 10/10oz LEFT/RIGHT 20 oz TOTAL PER DAY

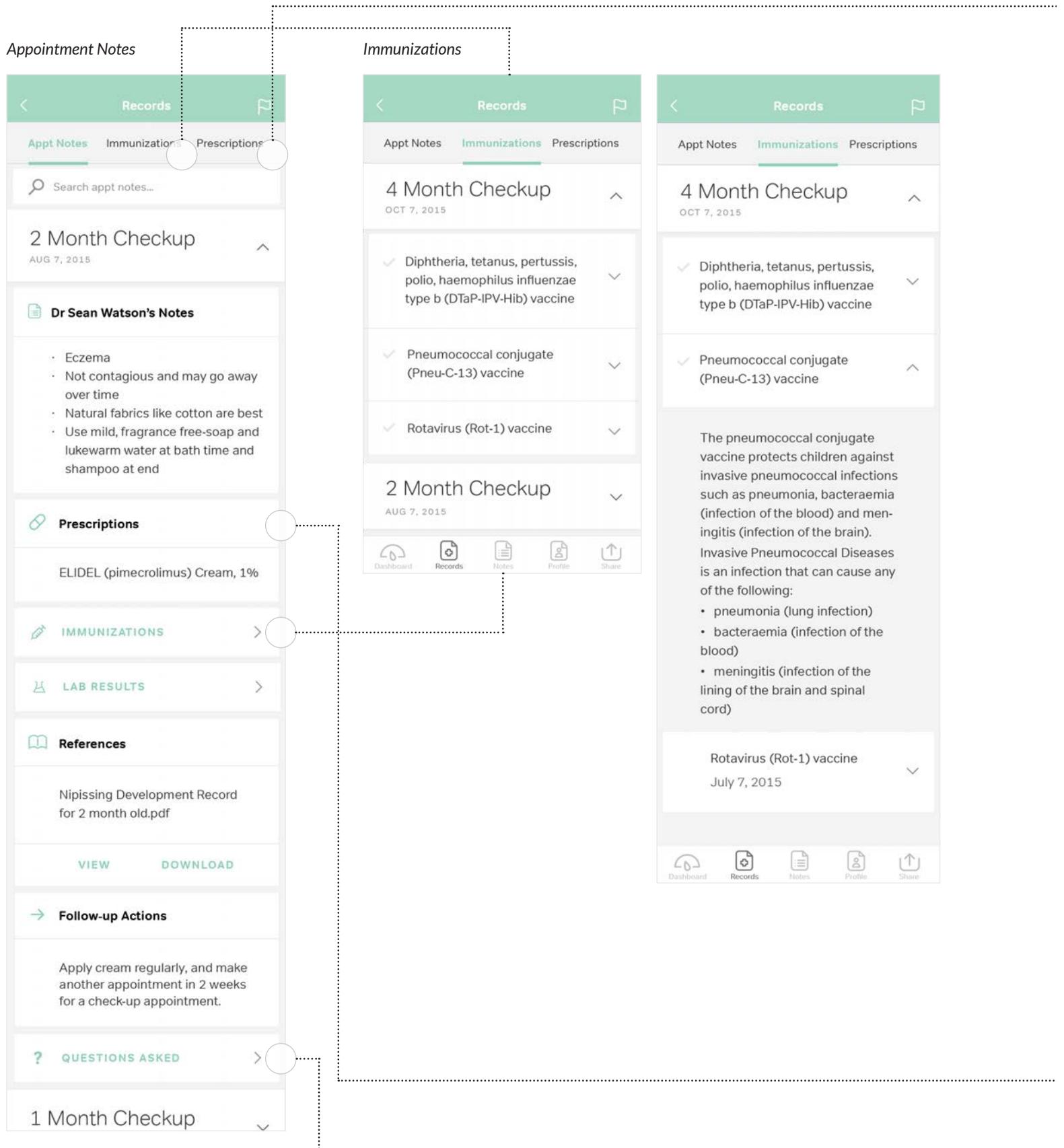
#### Trends

minutes ounces

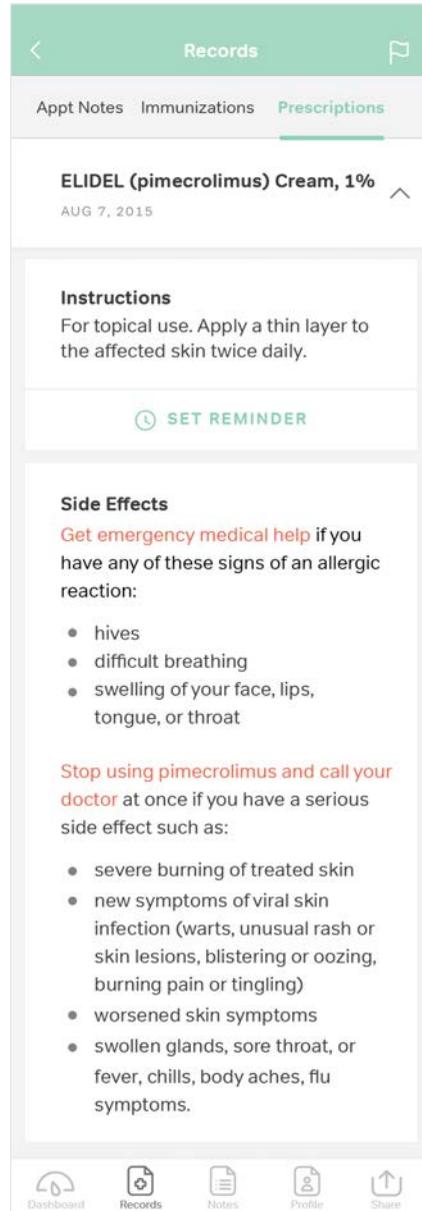
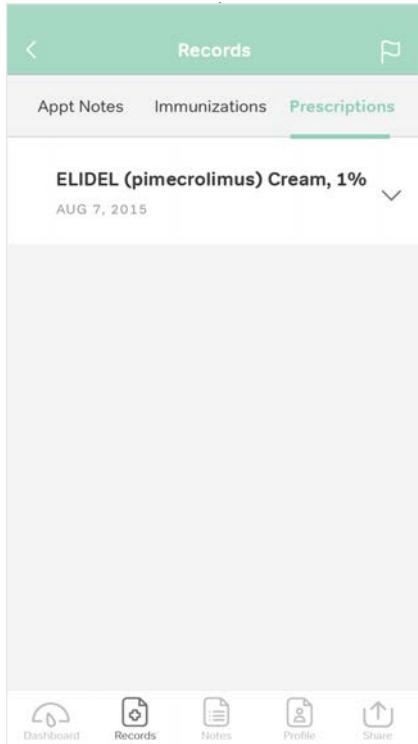
7/12 8/1 TODAY

Dashboard Records Notes Profile Share

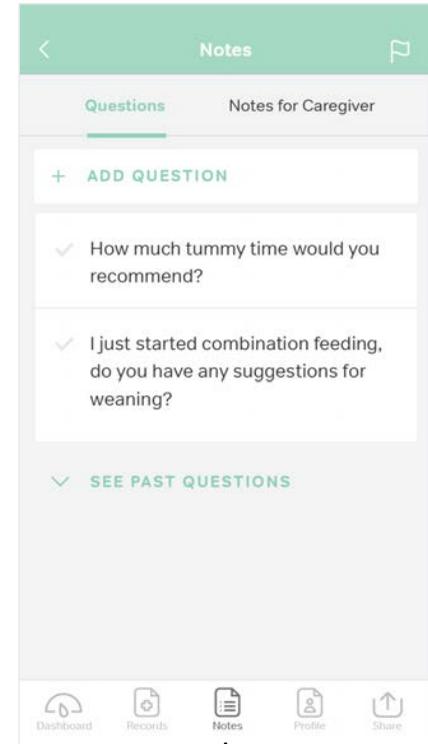
# User Flow Records



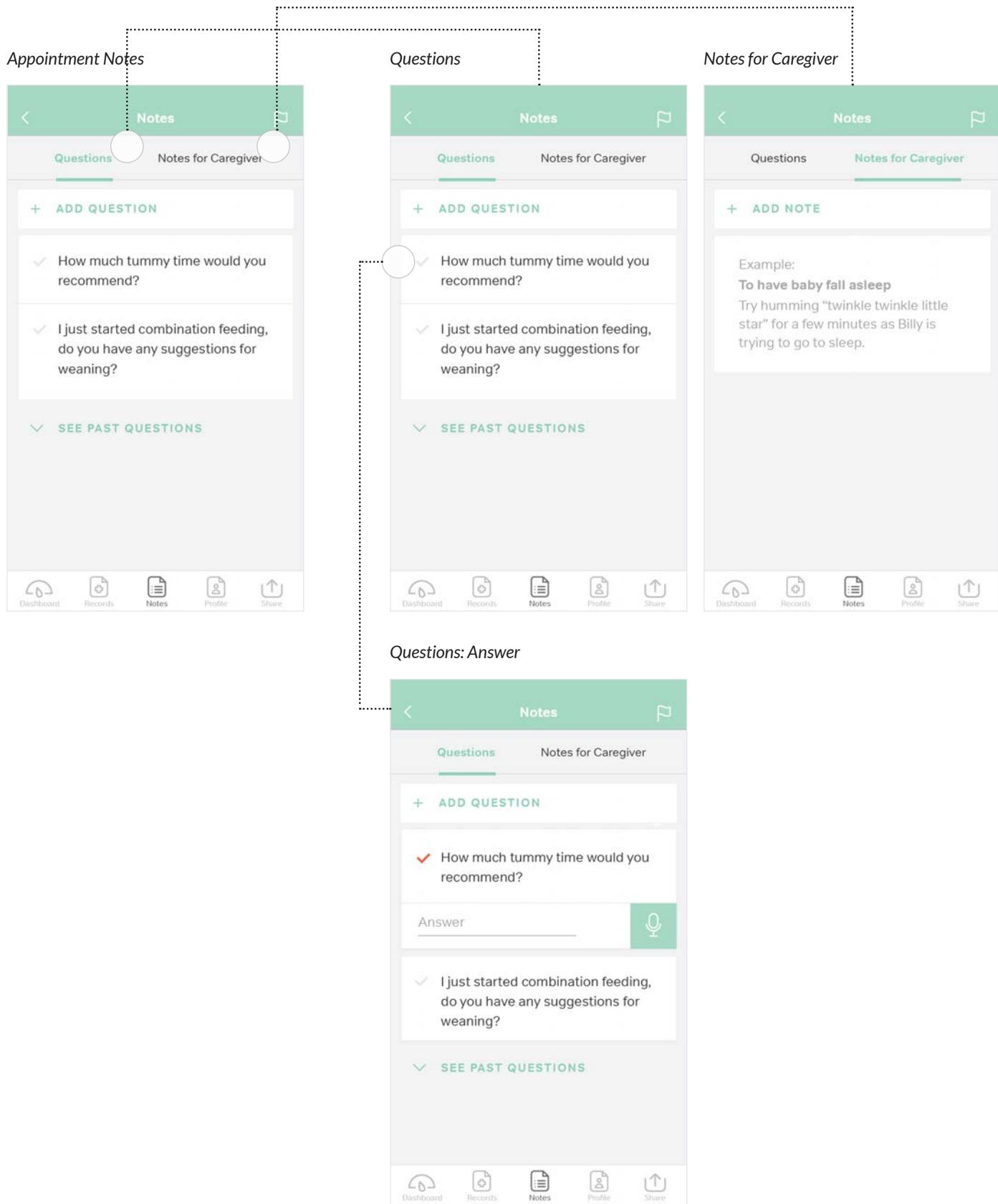
Prescriptions



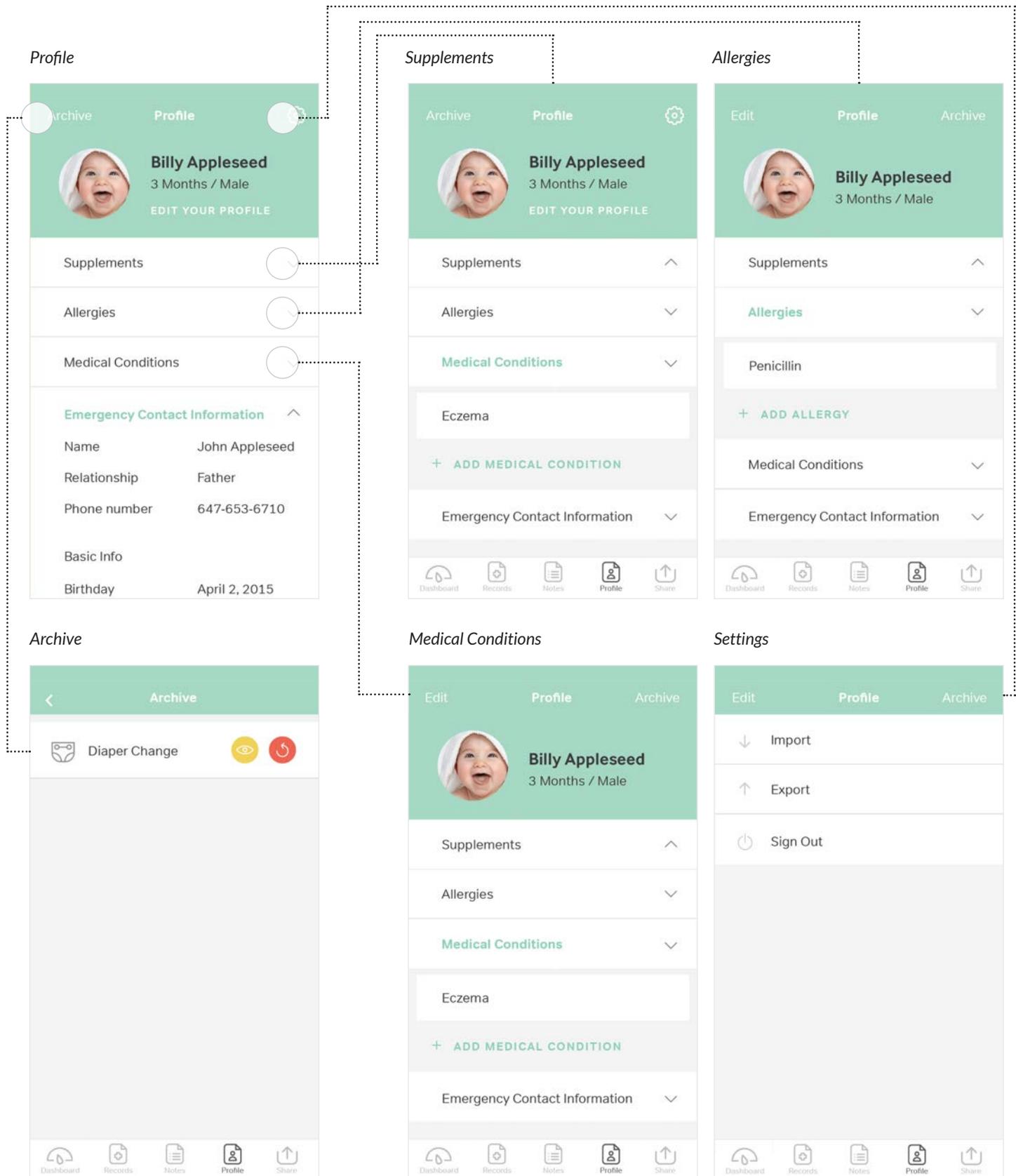
Notes: Questions



# User Flow Notes

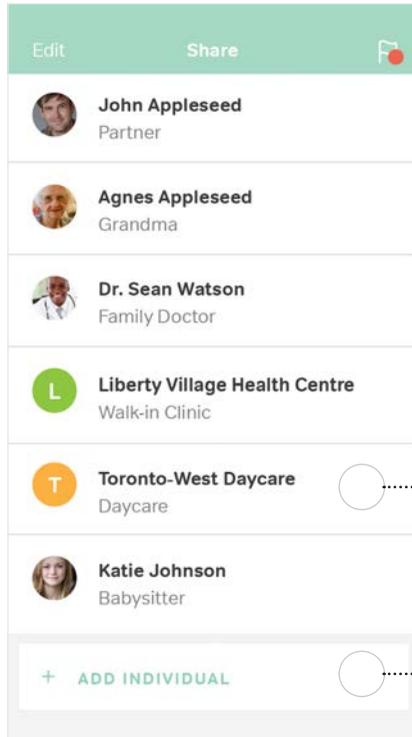


# User Flow Profile

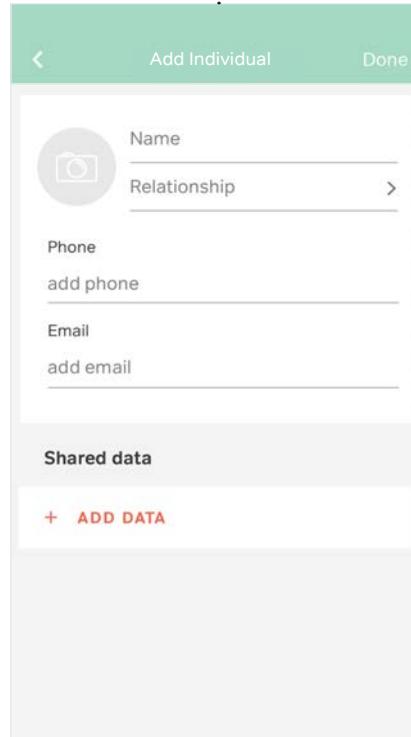


# User Flow Share

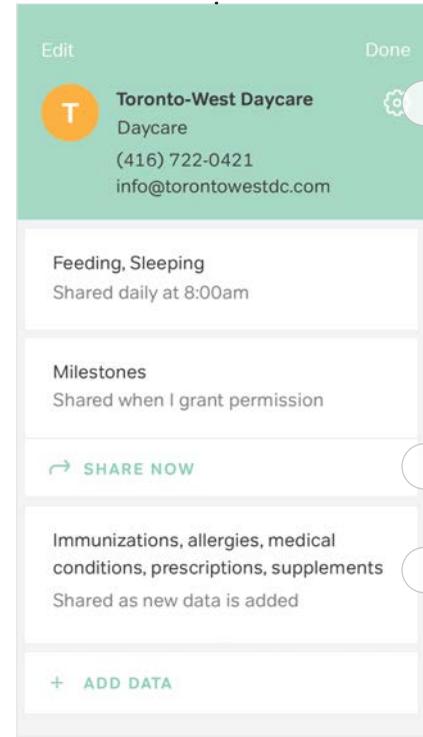
## Share



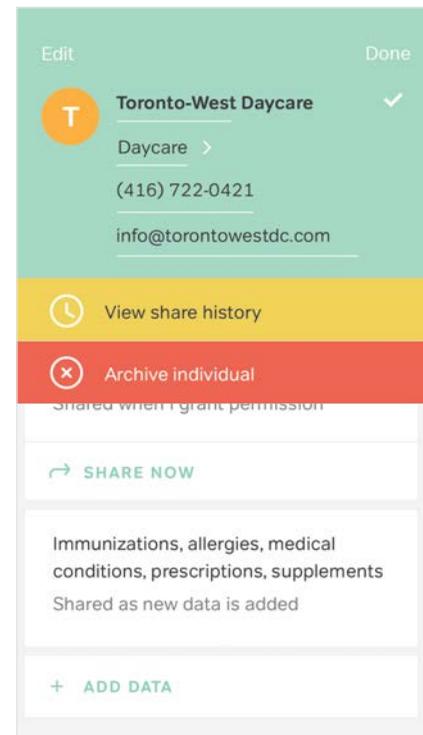
## Add Individual



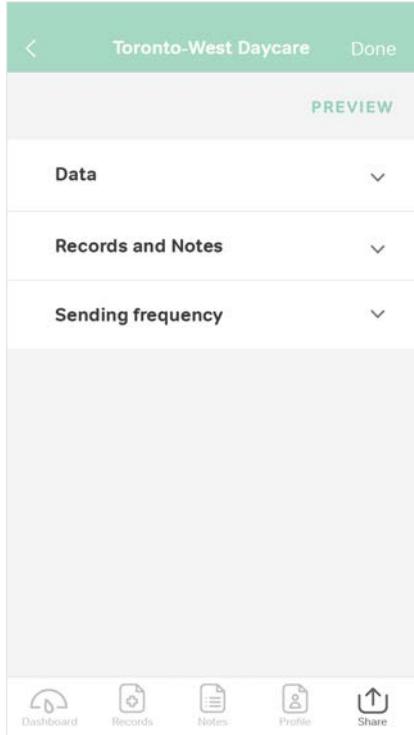
## Daycare



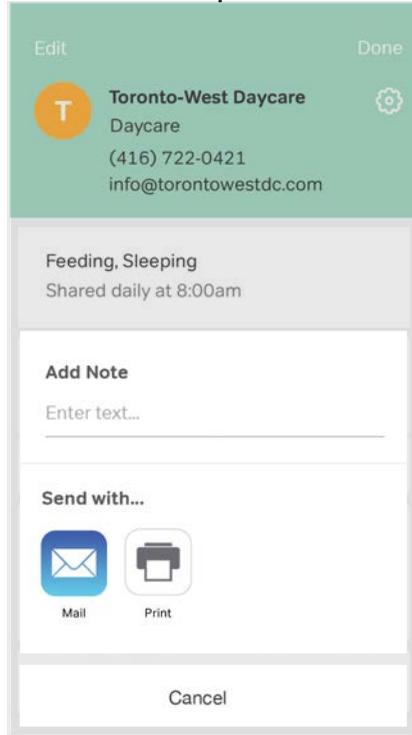
## Edit Caregiver



Edit Data



Share Now





# Design Rationale

## *Design Rationale*

# Marketing Card

The marketing card could be picked up at doctor's offices and hospital waiting rooms, and explains the core functions and value proposition of BabyBundle to moms. The purpose of the card is to help promote the service, by explaining the benefits of the platform and the value it can have in people's lives.

## INSIGHTS

- **User-Centered Design:** The moms we spoke to were an integral part of our success in this project. Of the moms who were involved with the project throughout the process, they felt it was valuable to provide more detail on the collaborative development.

## APPLICATION

- **Website:** We brought attention to the story behind BabyBundle by creating a website that walks users through our collaborative design approach.

## VALIDATION FEEDBACK

- **Both mother and child:** "I really liked the 'you and your child' element. It's so linked."
- **Pre-natal investment:** "You invest in this kid so if you can get accustomed to using it prenatally you'll be hooked in. If it was all built into one thing it would probably help people."

Keep you and your child happy & healthy with

# BabyBundle

BabyBundle streamlines access to your child's health record, helping you manage their health based on personal and clinical information.

## BabyBundle

is a collection of apps to help you take better care of you and your child's health and well-being.

**1 See Patterns & Trends**

Keep track of important metrics like feeding, milestones, sleeping, and more. Use wearables to automate entries.

**2 Access Health Records**

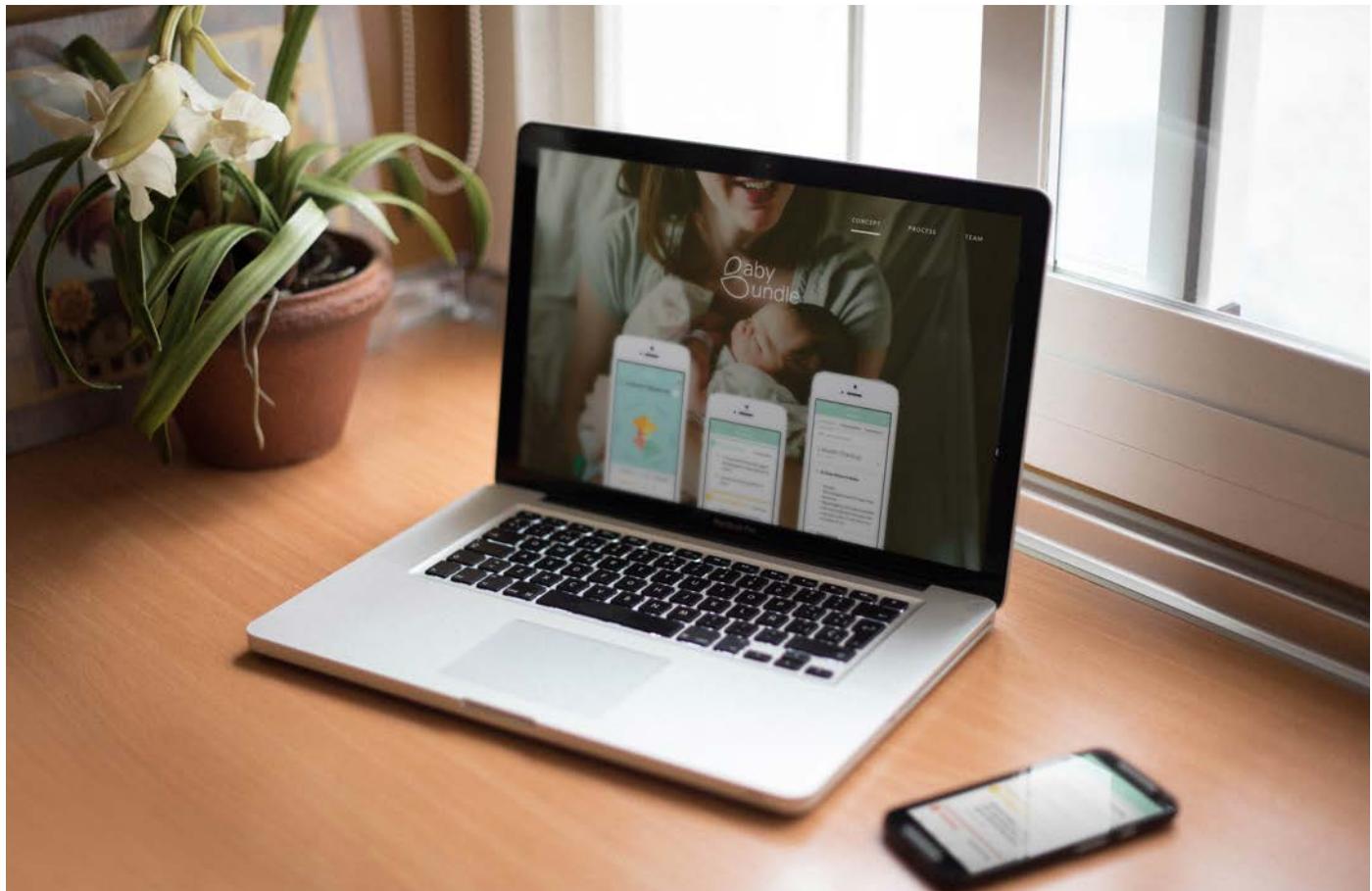
Through BabyBundle, you'll have access to information like your child's:

- Allergies
- Current medical conditions
- Appointment notes (including missed lab results)
- Prescriptions
- Immunizations
- Weight, weight, and head circumference

**3 Share & Send**

BabyBundle acknowledges that you know your child better than anyone, but you can't be everywhere at once. Keep caregivers and doctors in the loop by sharing info directly from the app. You control what information is shared, and when to share it.

This suite is a labour of love created with parents, for parents.



*Design Rationale*

# Dashboard

The dashboard serves as the home screen, giving users a quick snapshot of their child's overall health and wellbeing.

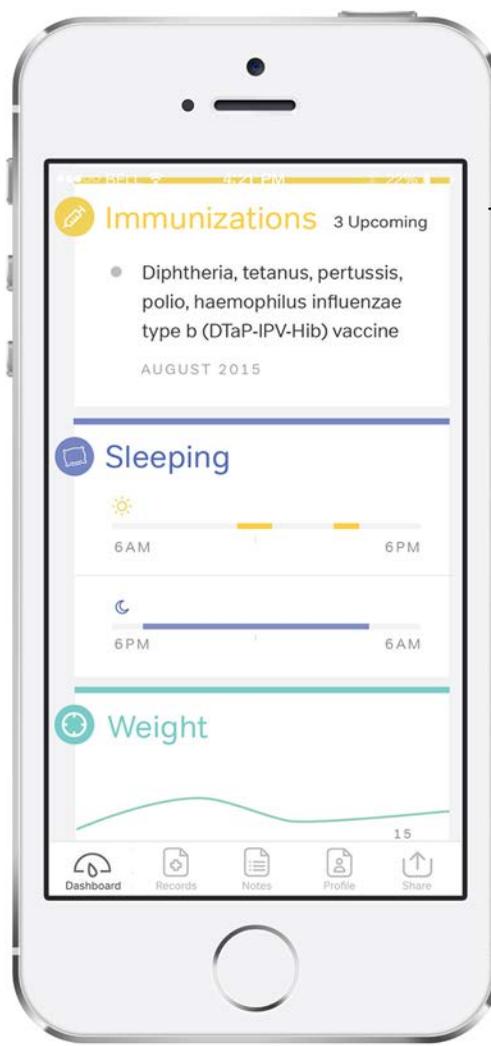
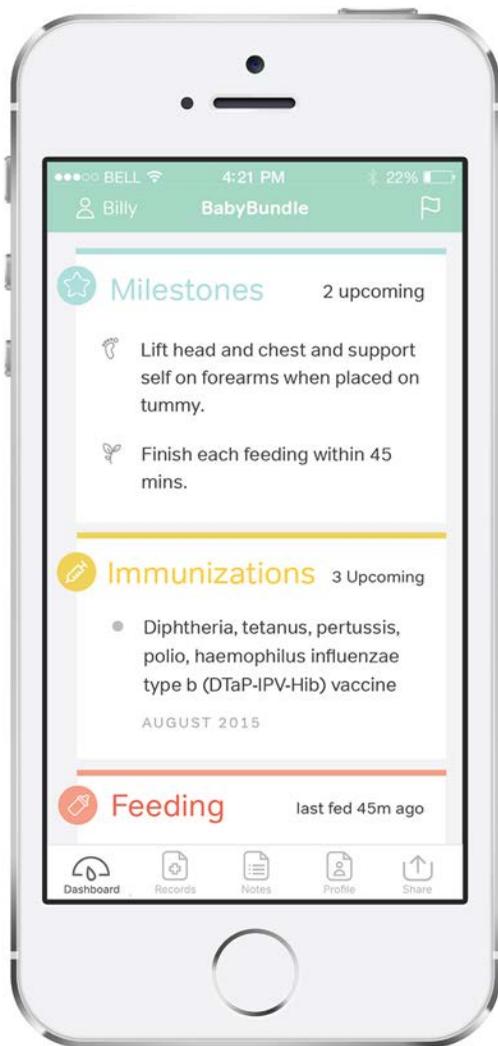
It draws attention to upcoming events, like new immunizations or upcoming developmental milestones. It also allows users to toggle between multiple profiles, for parents who have more than one child; view/modify collaborators; and import/export data to people within the child's circle of care.

## **INSIGHTS**

- **Everything in one place:** Each mom had her own opinion about what information she wanted to see at a glance. However, the ability to customize an at-a-glance view was highly appealing.

## **APPLICATION**

- **Hold and drag:** A fully customizable and action-oriented summary of their child's health.



**All in one place:** “I like that you can personalize the dashboard. Honestly, I felt a little app fatigue with baby stuff because you feel like there are so many different things. I like the idea that it can all be in one spot.”

**A calm, soothing interface:** “I love it, it’s friendly but it looks legitimate. [The app] doesn’t look like a little game. I find the colours, the font, and everything approachable and friendly, but it still looks like a tool, a medical tool and not a social network thing.”

## Design Rationale

# Milestone Outputs

The information moms are tracking related to milestones is pushed into the dashboard, where the data is summarized visually and in a checklist. Following the standard check-up times (according to the Rourke Baby Record), mom will see a set of milestones to be hit by the next Wellbaby check-up. These milestones are based on the Nipissing Developmental Screen and include: social/emotional, learning/thinking, language, physical growth, fine motor skills, gross motor skills.

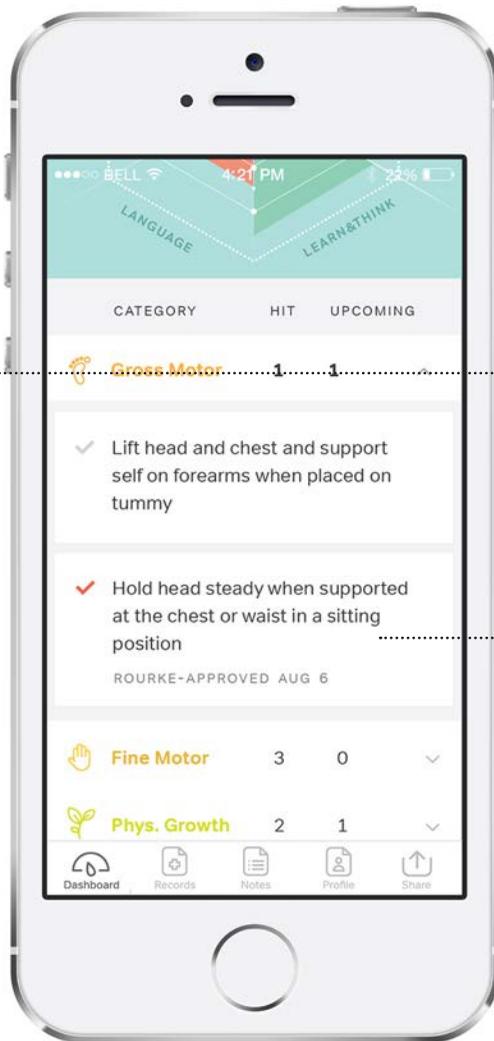
Once a milestone has been hit, mom can check that it has been 'completed' and the corresponding visual will grow. At the next appointment, the doctor will go through a routine assessment of development and indicate the milestones reached. When the doctor updates the child's EMR, BabyBundle refreshes to show that the milestone reached is 'doctor-approved.'

## INSIGHTS

- **Milestones 2.0:** Early research indicated that moms perceived milestones as a hard deadline. In reality, clinicians understand milestones as complex and nuanced, and only use the Rourke Baby Record as a guideline, not a checklist. This misunderstanding creates undue pressure for moms.

## APPLICATION

- **Holistic development:** We wanted to show moms a holistic view of their child's development to explain that a child's progress can happen quickly in some developmental categories, and more steadily in others, but that this is generally not cause for concern. When the 'question mark' button is clicked, a drop-down message opens to explain that each child's development is unique. This gives moms the tools to set realistic expectations, and to feel a sense of ease.
- **Guidelines:** Each developmental category begins growing from a snapshot of the child's development based their previous check-up (centre ex. 2 months) and continues into current expectations (ex. 4 months) and beyond (ex. 6 months). A child can move beyond current expectations, into the upcoming milestones. Each phase builds on the last to show that development is constant and ongoing.
- **Rourke-Approved:** Mom checks off milestones that her child has hit prior to the Wellbaby check-up. Once the doctor has validated that these have been hit, recording it in the child's health record, a "Rourke-Approved" update appears.



**Setting expectations:** “What you see under milestones at four months is what they should be hitting by the four month check-up. So if the child is three months old, the parents know what they’re looking out for” – HCP

**Data visualization:** “You get an instant picture of where areas were stronger and weaker. It sort of corresponds to their whole growth and that’s what a child is doing, it’s getting bigger.”

**Hit and Upcoming Milestones:** “That’s the two parts of looking at milestones. You check where you’re at and you’re like okay, so here’s where we are and yes we’re meeting milestones or no we’re not. And then you look ahead and you go okay, what’s coming up, what should I be looking for?”

## Design Rationale

# Feeding Outputs

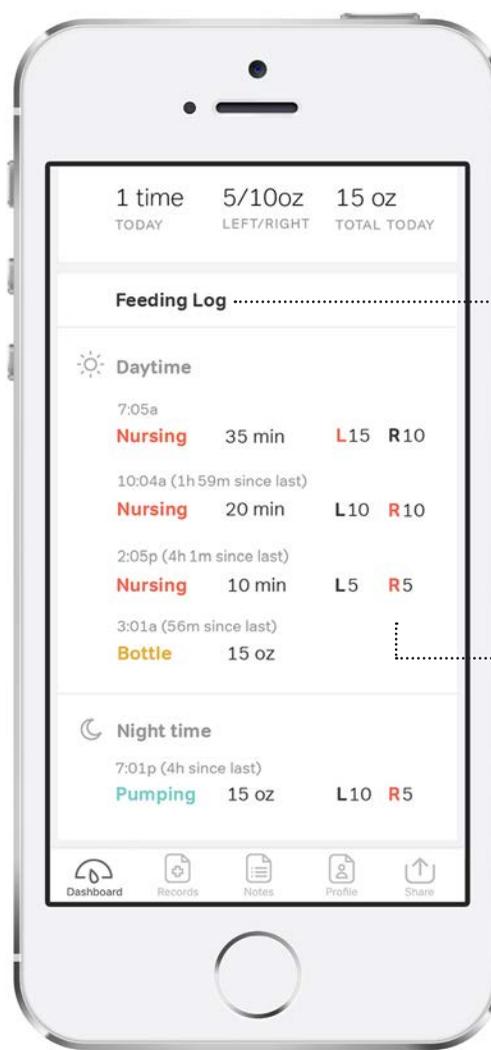
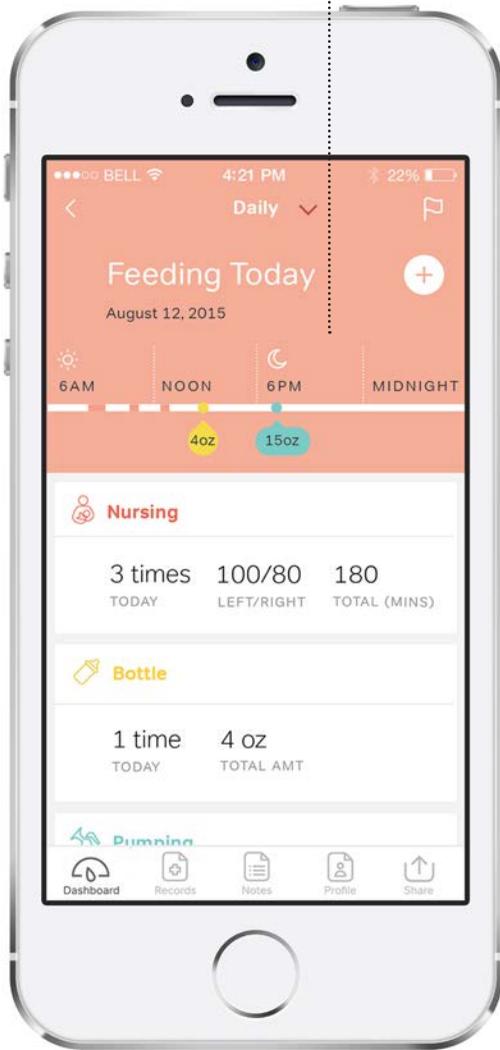
The information mom is tracking around feeding is pushed into the dashboard, where the data is summarized in logs, charts, and graphs. This information provides mom with a better understanding of her child's intake.

### INSIGHTS

- **Maybe breast isn't best:** Breastfeeding is a personal decision and each mom approaches feeding differently—some exclusively nurse, others exclusively bottle feed, and some do a combination of both.
- **Personal benchmarking:** Moms had no interest in benchmarking data they had collected on their own (ex. Breastfeeding tracker) with clinical guidelines (ex. Normal clinical ranges). Instead, preferring to see how their inputs stacked up against other points in time.
- **Visualizing trends:** Moms wanted a way to view patterns and trends that would highlight dramatic changes. Knowing this information was useful in speaking to these concerns, primarily with a doctor or lactation consultant.
- **Strength in numbers:** Seeing the amount of time between feedings, frequency, total, and side, helps mom structure her day and predict how long her child will sleep at night.

### APPLICATION

- **Hold and drag:** Add and remove the feeding type to your preference, so that only your preferred method is visible.
- **One size doesn't fit all:** The feeding summaries are shown in a daily, weekly, and monthly view. Each of these 'views' are intended to highlight different 'need-to-know' information. For example, the weekly/monthly summaries emphasize trends and averages, while the daily view offers very specific measurements throughout the day.



**To each their own:** "I think of it in terms of how long was each session, and how many sessions were there, and what was the space between each session."

**Feeding Log:** "Seeing the last [feeding] and the first one is helpful. I struggled a lot with figuring out bedtime according to feeding. This tells me how much she needs and when I did the last feeding of the day so that I can see if she'll have enough through the night."

**Daily log left/right:** "Sometimes you're going to have a feed where they're going to take both sides within the same feed, and then sometimes it might just be left or just right."

**Weekly averages:** “[The averages] are good to know. It would give me a much more global sense and gives me a lot of insight”

**Inclusive feeding methods:** “This is nice, that it has the mix of bottle, breastfeeding, and pumping.”

**Real-time pattern recognition:** “I like this idea that in the [weekly] graph you can go in for the daily view. You can see the left, right, you can see the exact times of when things were happening.”

**Long- and short-term trend spotting:** “This helps me see the trends over a whole week. That way I can point to a specific day and say ‘what happened there’ and click it to see what was going on that day”



## *Design Rationale*

# Records

The records section is where the majority of clinical health information is housed, providing quick access to appointment summaries, a list of completed/upcoming immunizations, and prescriptions.

### **INSIGHTS**

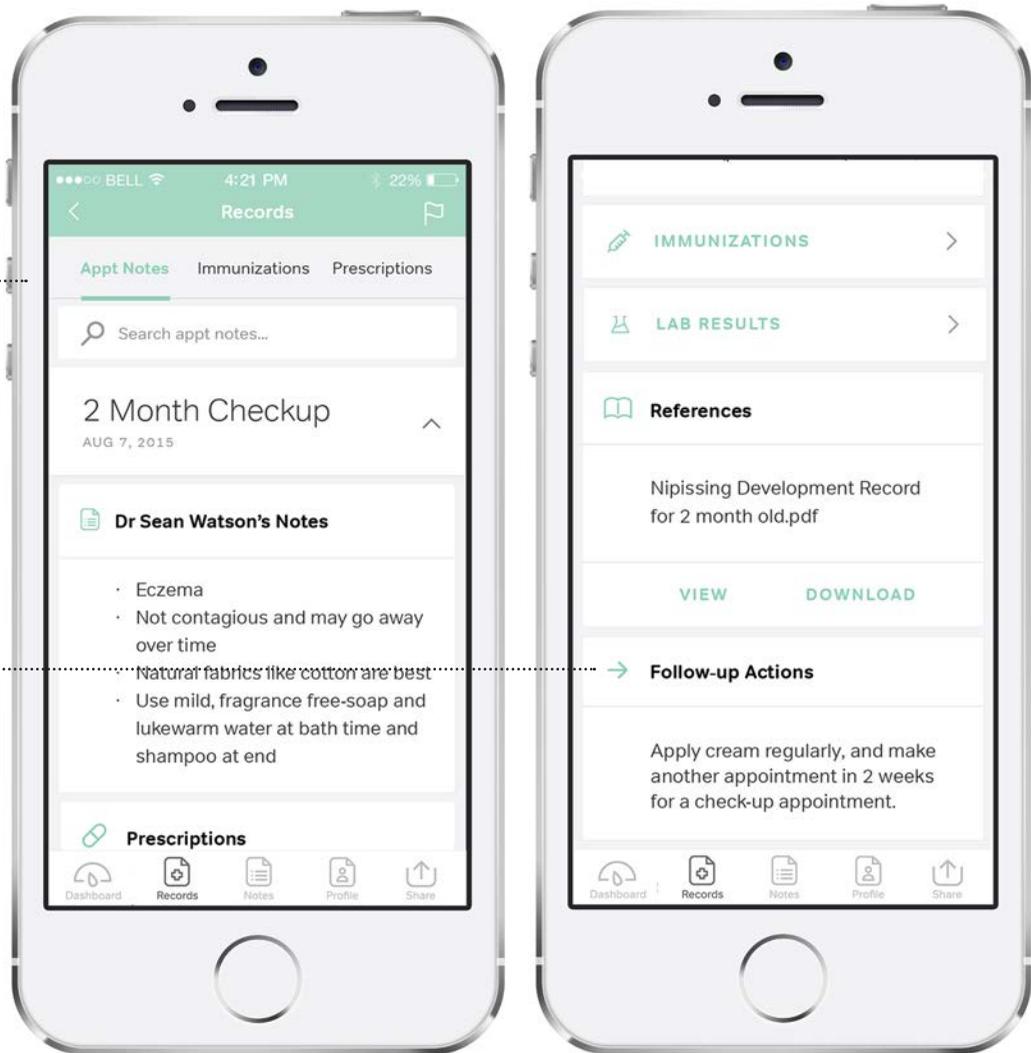
- **Once upon an appointment:** Moms likened the appointment summary to a story that showed them the event of each appointment beginning with what happened, and ending with next steps. Moms agreed that this global view provided the necessary context to better understand how smaller events fit within their child's overall health and wellbeing.

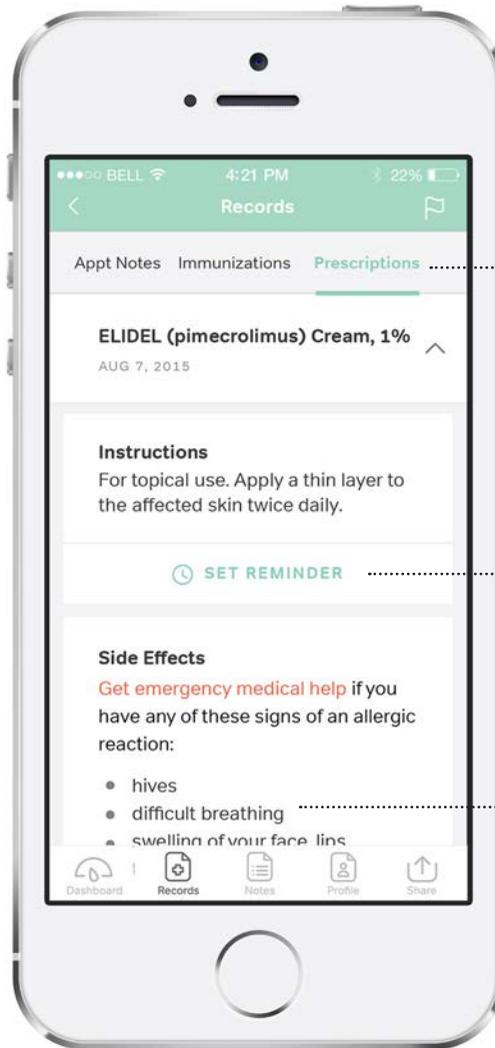
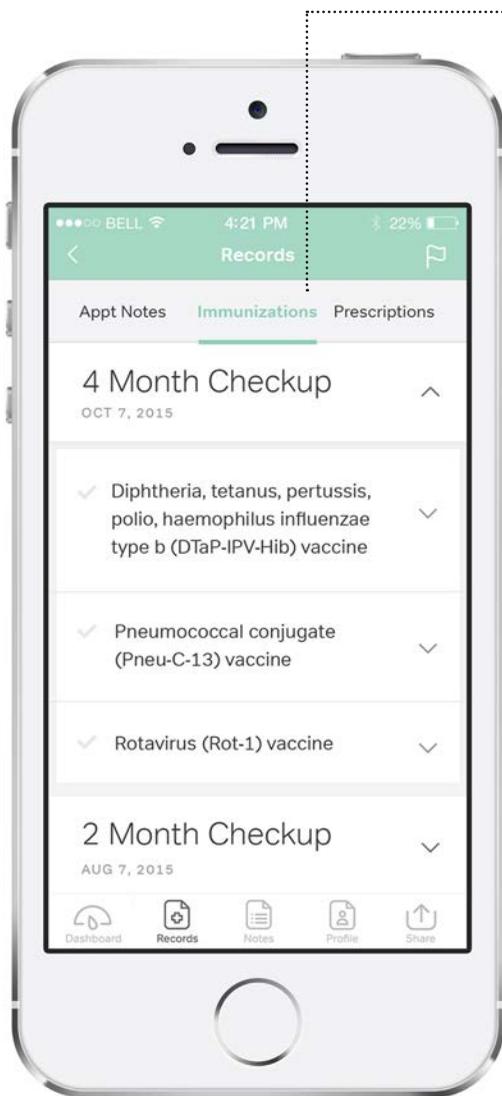
### **APPLICATION**

- **Storytelling:** We took a narrative approach to the appointment summary, to help moms see how all the discrete pieces of data fit together, including:
  - **Where/When:** Date/time
  - **Who:** Doctor's name
  - **Why:** Visit notes
  - **What:** Prescriptions, immunizations, lab results
  - **How:** References, follow-up actions, questions asked

**Appointment Notes:** “I do like the appointment notes to be everything that happened at that appointment. Makes sense to have it there as a complete thought.”

**Follow up actions:** “[I’d like] a place for you to fill out what you did to address a problem. That way it’s a complete story. It’s not only that you’re looking back to see what happened at the appointment, but you need to learn so that you can react faster and better next time. It’s a lesson.”





**Immunizations:** "I would find that very useful, knowing what the next immunization would be. It's so affirming to be informed. It gives you so much more confidence."

**Prescriptions:** "This is amazing. They'll say, "What are they on now?" So it's very important to know what your kid is on now?"

**Setting reminders:** "I like how you've got the date of prescriptions visible and a way to set reminders. I think that if you did have a list of them, then that's a really important thing to have."

**Side effects:** "If it's the kind of thing they include with medicine anyways then it should be included. Like take this at meals, don't combine with whatever. That's kind of the same as instructions, but just more extensive"

## Design Rationale

# Notes

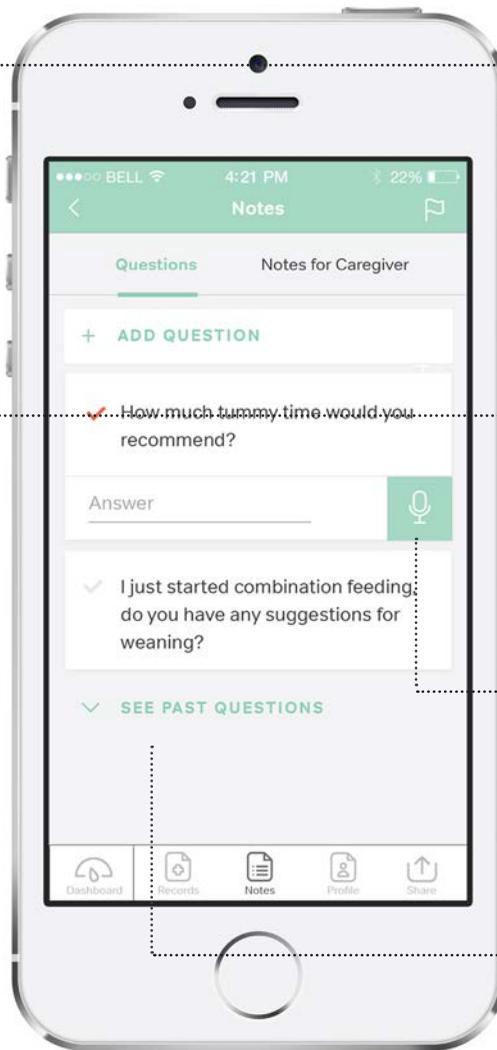
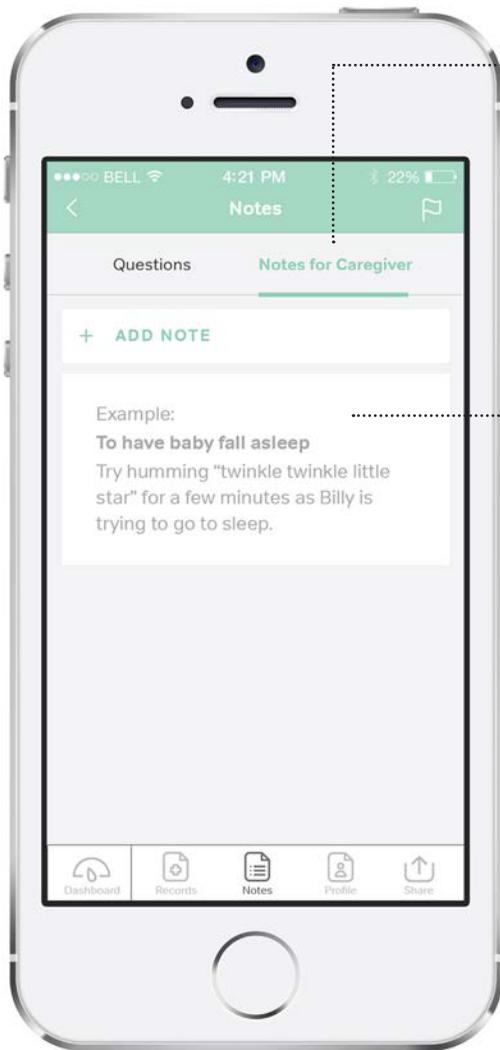
The notes section is where moms can record questions, with a space to record any notes that should be shared with caregivers.

### INSIGHTS

- **Baby Brain:** When moms write down a non-urgent question for the doctor, it could be a couple months before they have the chance to ask.
- **Juggling a million things:** At doctor's appointments, moms typically have their hands full holding the child, or keeping them still (if they're mobile). This makes it difficult for her to record the doctor's answers.
- **Broken Record:** The information a mom shares with different caregivers can sometimes be repetitive. Moms find that they tend to provide the same, or similar, notes about the needs, preferences, and instructions for caring for their child

### APPLICATION

- **Under one roof:** In the interest of streamlining the way notes and reminders are presented, we wanted to keep all free text entries in one place.
- **Refer back:** Current notes can be archived when they are no longer relevant. Past questions and answers are accessible, but won't overtake the notes section.
- **Take a load off:** When moms receive answers to their questions, they have the option of either typing the answer during or after their appointment. They can also record the doctor's instructions to replay at a later date.



**Notes for caregivers:** “Baby’s preferences’ is maybe not the right term. Maybe that’s too neutral and maybe it doesn’t note that you would be sharing it. Maybe if you built that into the name of it like notes for caregivers. That would make more sense.”

**Note example:** “It would be good to have examples that you could erase and then replace with your own. Just to give suggestions of the kinds of things you could use it for.”

**Voice record button:** “It would be nice to have a place where I can write answers there. Did I ask that? What did he say? Oh, I did and here’s the answer.”

**See past questions:** “If you had all this stuff archived you could see the questions that you asked at two months and you’d probably already have the answers that you needed.”

## *Design Rationale*

# Profile

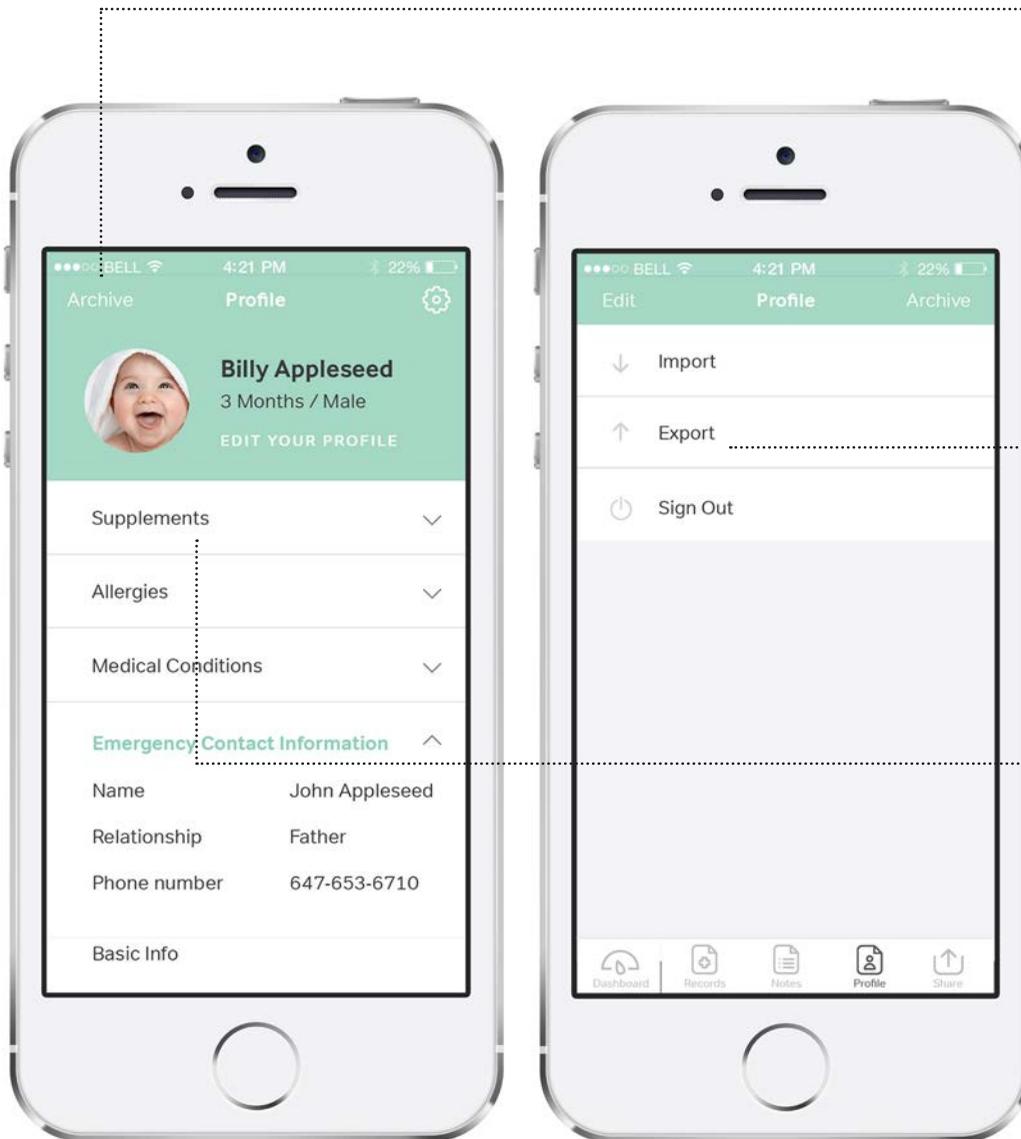
The profile is where you can find any biographical information, emergency contact information, and a summary of clinical information that moms can manage on their own.

### **INSIGHTS**

- **Modifying allergies and conditions:** Although allergies and conditions are technically part of the clinical health record, moms brought to our attention that these pieces of information could change over time.
- **Medication:** Prescriptions and vitamins/supplements are considered distinct information, but both are important to document, serving different purposes.
- **Putting the personal back in personal health:** Personalizing health information is important, which means that biographical information shouldn't be detached from the data being shared externally.

### **APPLICATION**

- **A complete picture:** The banner bar containing biographical information in the profile is sent with all shared information, providing context for the recipient.
- **Health management:** Any clinical information that can be updated and revised is in the profile. That way moms can manage this information at their discretion.



**Archive:** “[Viewing your archived information] is really good for advocating for yourself if there was something that got missed. These clues are already all there.”

**Export:** “I would love to have it as a physical thing outside of my phone. When you move away from this, or you move to the next technology when they’re not babies anymore, then you could still have that physical information.”

**Supplements:** “I wouldn’t mind having vitamins here as well. Kids are not to take vitamins, but some parents give them. That’s important for the doctors to know.”

## Design Rationale

# Sharing

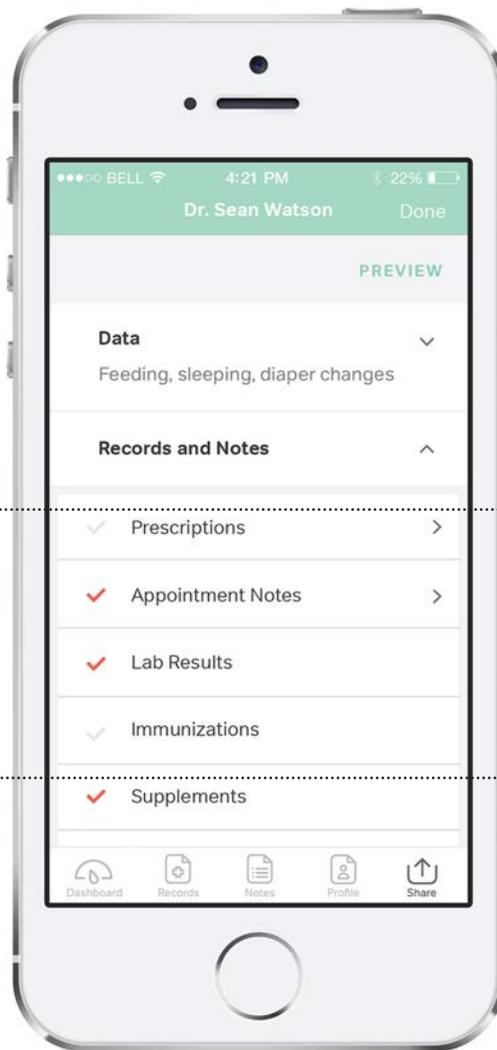
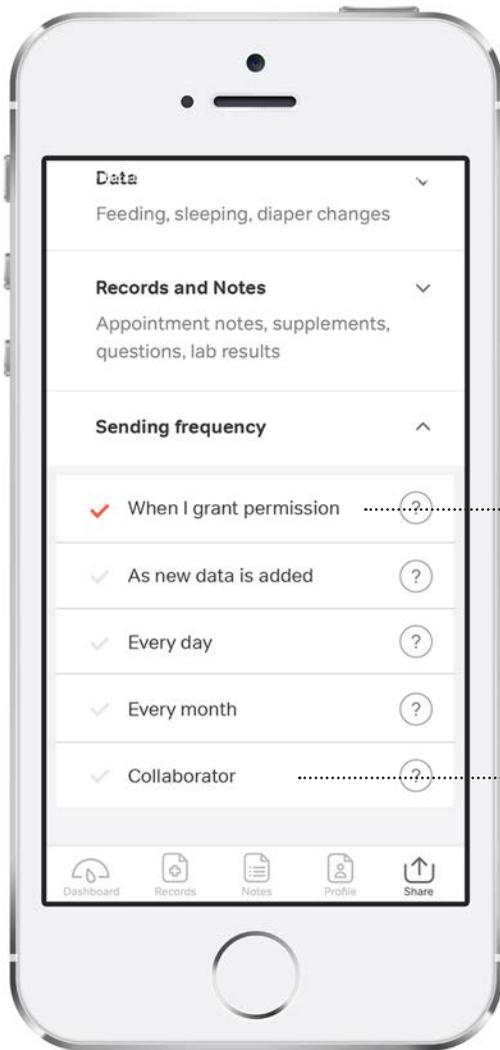
Any data within the BabyBundle can be shared with caregivers and healthcare providers. Mom can customize what information is being shared, when to share it, and whom to share it with.

### INSIGHTS

- **Sharing is a personal choice:** The information moms are sharing and how often they are sharing it is difficult to define because:
  - Parenting styles differ
  - Moms differ in their interest in recording and tracking data
  - Relationship with recipient
- **Collaborator confusion:** There was variation on how moms interpreted the frequencies, in particular the role of the collaborator. While moms understood collaboration correctly as an ability to push data in, they differed on the actual amount of information a person could push in and how much they could actually see.
- **Pushing daycare information in:** Moms we spoke to consistently mentioned the summary reports they currently get from their child's daycare by print or e-mail, and wanted those to be pushed directly into the app. They wanted daycare providers to be able to fill in the gaps of feeding, sleeping, milestones, and diapers to help them "make decisions for the rest of the day."

### APPLICATION

- **Personalization:** For each contact, there are suggested pieces of data checked off. However, this can be modified as needed.
- **Purpose contextualized:** Each frequency has a dropdown example to provide context and rationale



**No longer lost in translation:** "If I was going to a new doctor and I wanted to summarize that stuff, then it could be helpful."

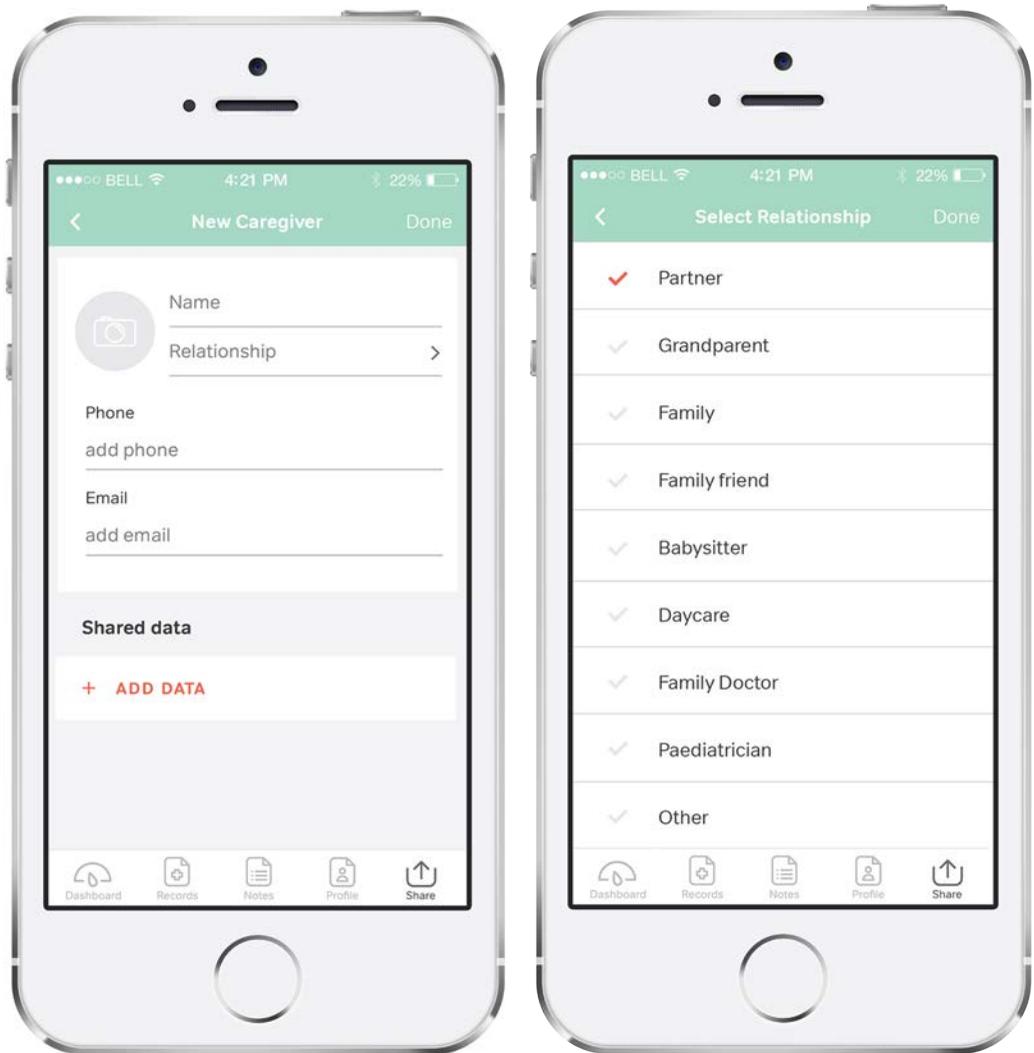
**Seeing the value:** "This would be really good if I could share [my records] with them. I'm applauding this, because it's really good".

**When I grant permission:** "I want control of it so that it only happens when I initiate this exchange."

**Collaborator terminology:** "I really like the mildness of the word "collaborator." Whoever came up with that, I'd like to give you props. Really well done."

Personalized settings: “[sharing] is an individual thing”.

Freedom to add: “Really cool, love that. Especially if there are multiple parents or multiple care givers.”







# Moving Forward

- 98 Future areas of exploration
- 100 Tools and Deliverables
- 102 Solution Map

*Moving Forward*

# Future Areas For Exploration

The ecosystem we created for the BabyBundle service was not built with the intention of market roll-out at the current time, but is intended to serve as an interactive tool to present to stakeholders. The BabyBundle service is a model to help promote the objectives of MyHealth and to show stakeholders what accessing health information could look like. Below are suggested areas of inquiry that we believe are important to explore further.

## DESIGNING THE DEFAULT

To share information, you must select a recipient, and then define what you want to share, and when you want to share it. Any information on the app can be shared with someone as a collaborator when permission is granted - everyday, every week, and as new data is added.

During validation, we learned that sharing is an incredibly personal choice. The information moms are sharing and how often they are sharing it is very difficult to define as a default because:

- Parenting styles differ
- Moms differ in their interest in recording and tracking data
- The relationship of the recipient differs

The sharing function was of great interest to mothers, but with the stipulation that they had complete control over what they were sharing and when they were sharing it. The suggestions we made for sharing with the daycare, the child's doctor, and a walk-in clinic are an aggregate of the conversations we had, and offer a starting point for discussing the possibility of a sharing default.

## GAINING CONSUMER TRUST

Mothers we spoke to during validation did not feel it was necessary to benchmark the data they were entering against clinical guidelines and ranges. However, we used clinical-based language to explain the prototype during validation. Using terms like 'Rourke Baby Record,' 'Nipissing Developmental Screen,' and 'electronic medical record.' As a result, mothers who asked us about the sources of information were pleased to know it was based in evidence. Mothers were also quick to comment on how "legitimate" the interface looked and that "it doesn't look like a game."

As MyHealth begins to explore its other potential user-groups, we believe that to gain trust is not simply in the use of evidence-based information, but in the look and feel. It must strike a balance between friendly and inviting, but also professional.

#### EXPANDING USE

In discussions about sharing with their child's daycare, moms consistently asked about the daycare's ability to push certain information to the platform. Pushing out information was just as valuable as having information pushed in because it helped to "fill in the gaps" during the day. Information about their child's sleep, bowel movements, and feeding were very crucial in helping mothers maintain patterns and know what to expect after a day away from their child.

Currently, this information is already being pushed to parents by daycares either via email or paper. While the ability to push out this information was highly regarded, it's important to note that a one-way communication with institutions like daycare may not be enough to sustain longer term investment. In order to fulfill all of a mother's needs with one single tool, use should be expanded to allow two-way communication of data with the daycare.

*Moving Forward*

# Tools and Deliverables

Included in this project are a set of deliverables designed to aid MaRS in moving the development of the Consumer e-Health Innovation Platform forward. Deliverables were made to assist in a variety of purposes.

## DEMONSTRATING CONCEPT

Indicate unique user flows and interactions to potential developers or investors.

## DEMONSTRATING VALUE

Reveal value of the concept and how it addresses pains within the maternal experience.

## REPLICATING PROCESS

Demonstrate the value and process of a human-centered approach to solving public health problems and access templates used for this project.

## EMPATHY FOR NEEDS

Share with decision makers the needs of mothers and gain empathy for a human-centered solution.

## PUBLIC INTEREST

Share the story of BabyBundle and gain public support and consumer interest.



**Solution Book**

Demonstrating Concept  
Replicating Process  
Empathy for Needs



**Proof-of-Concept**

Demonstrating Concept



**Slide Deck**

Demonstrating Concept  
Empathy for Needs



**Marketing Card**

Demonstrating Value  
Public Interest



**Website**

Public Interest  
Demonstrating Value  
Demonstrating Concept



**Marketing Poster**

Demonstrating Value  
Public Interest



**Insights Videos**

Empathy for Needs

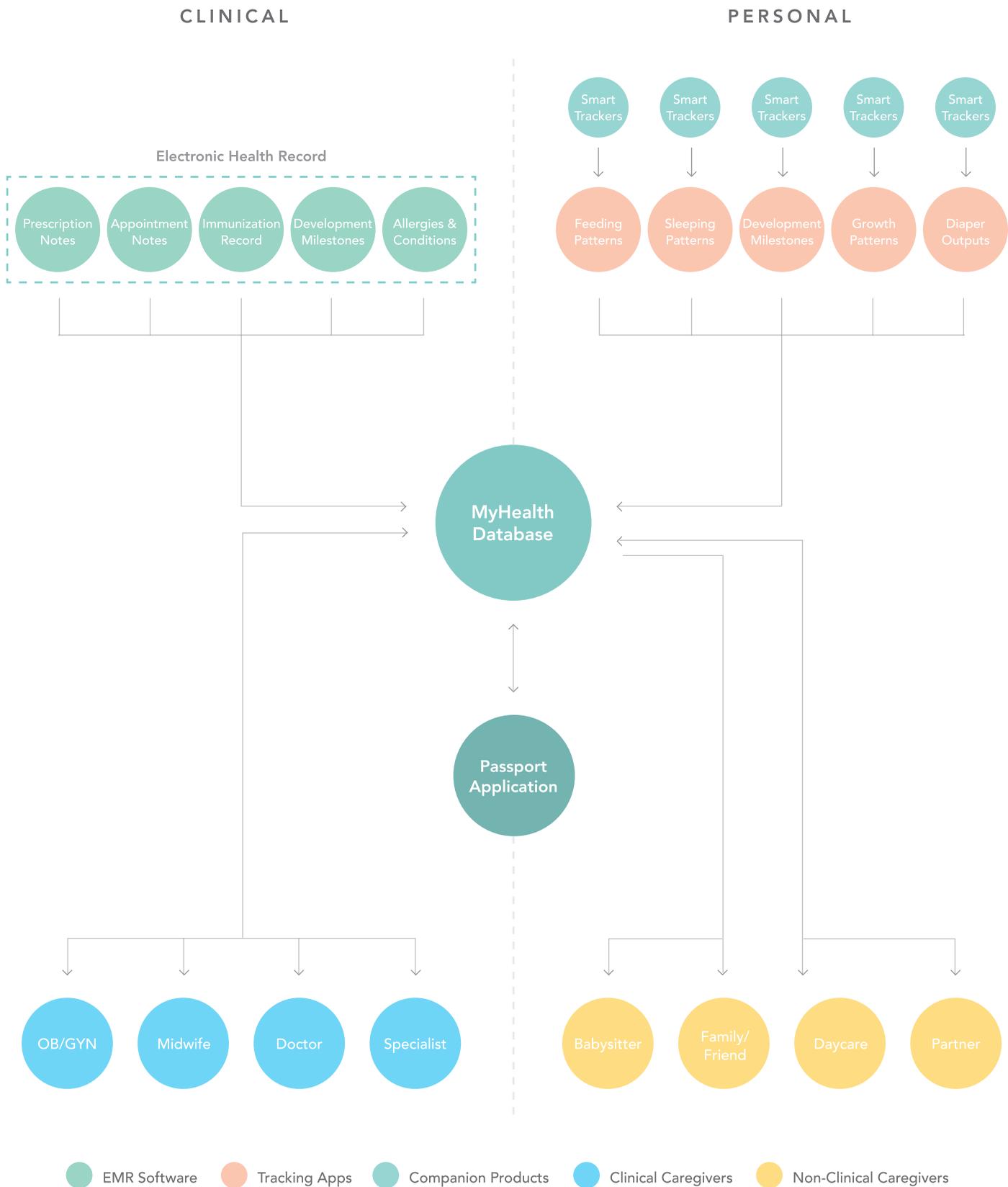


**USB Stick**

Replicating Process

# Solution Map

The System Map outlines all of the health information that BabyBundle connects with and all of the caregivers the system can share with.



“

The next time we have a kid if there's something like this, **it will be a completely different experience”**

- MOM, VALIDATION SESSIONS



# About the Team

# About the Team

## To all our collaborators:

We want to say a big thank you to everyone who helped us throughout the process.

To the mothers (and their babies): thank you for sharing your stories with us, for inviting us into your homes, and for making this learning process truly enjoyable. Your creativity and feedback was invaluable.

To the bridgeable staff: thank you for your patience and support and for letting us pick your brains.

To the team at MaRS: Thank you for asking us all the right questions, and for pushing us to discover.

Lastly, thank you to the healthcare professionals, health innovators, and UX professionals for your participation and time.



### Elinor Keshet

*Researcher*

Elinor is a knowledge translator and strategic designer in the healthcare sector, applying the tools of human-centred design to generate sustainable public sector change. She holds a Master of Public Health from the University of Toronto's Dalla Lana School of Public Health, with a specialization in health promotion.

“I spent the first month of this summer just trying to frame the challenge at hand--it's pretty tough to wrap your head around systemic change. I also learned that no matter how much you try, you can never anticipate all the pivots. I learned to acknowledge these not as frustrations, but as inspiration to push myself to my creative limits. I have a lot of trust in the process now, and understand how valuable it really is to bring the end user in at each step of the process.”



## Stewart Dowdall

*Strategist*

Stewart is an urbanist, entrepreneurial thinker and creative problem solver focusing on human-centered design. Stewart has a degree in Urban Planning from the University of Waterloo with a specialization in Urban Design.

“Over the summer I learned the benefits of a generative design philosophy. I've never worked on a project where user insights were gathered before the first prototype was made. After hosting a participatory research session and co-creation session, I was able to experience the merits of exploratory design research and how it can be used to make solutions that truly represent user needs.”



## Cheryl Li

*Designer*

Cheryl is a communication and interaction designer who is passionate about creating social change and humanizing the complex through practicing human-centered design. She has a Bachelor of Design from Emily Carr University of Art + Design in Vancouver, BC.

“Through working on BabyBundle, I enjoyed learning about participatory design through facilitating co-creation the most. Being able to help users ideate early stage prototypes that addressed their own needs allowed me to see the power of co-creation as a form of empowerment, and a method of creating effective change.”

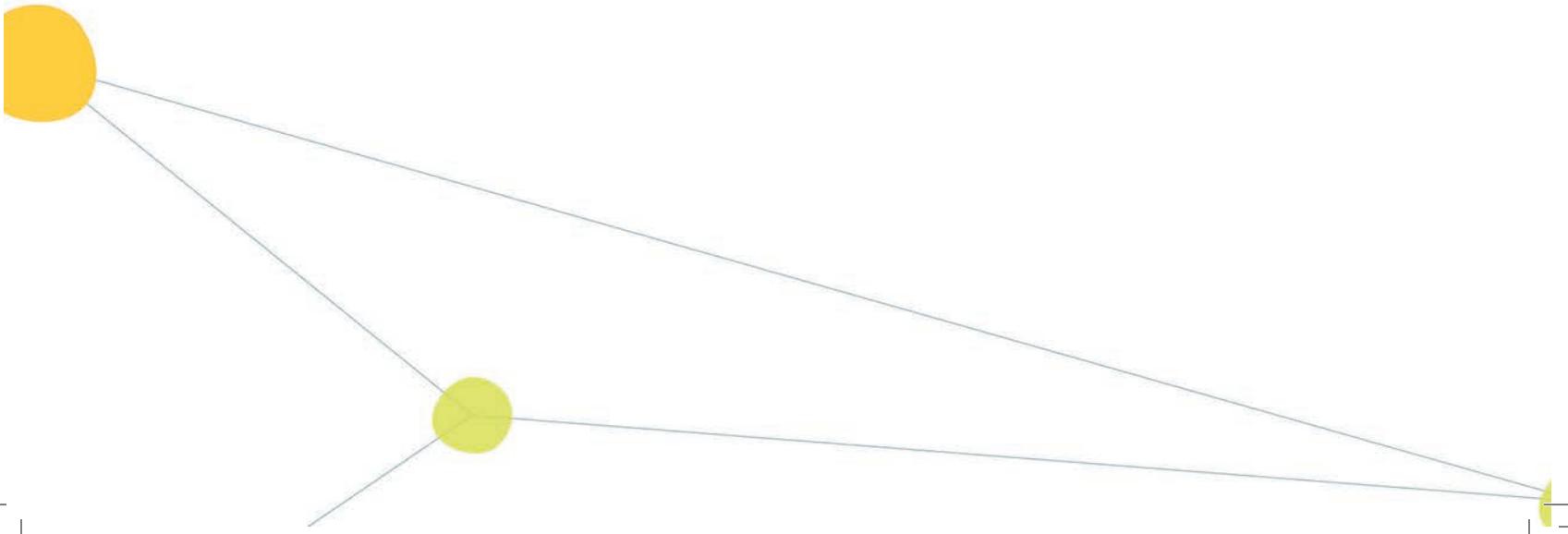


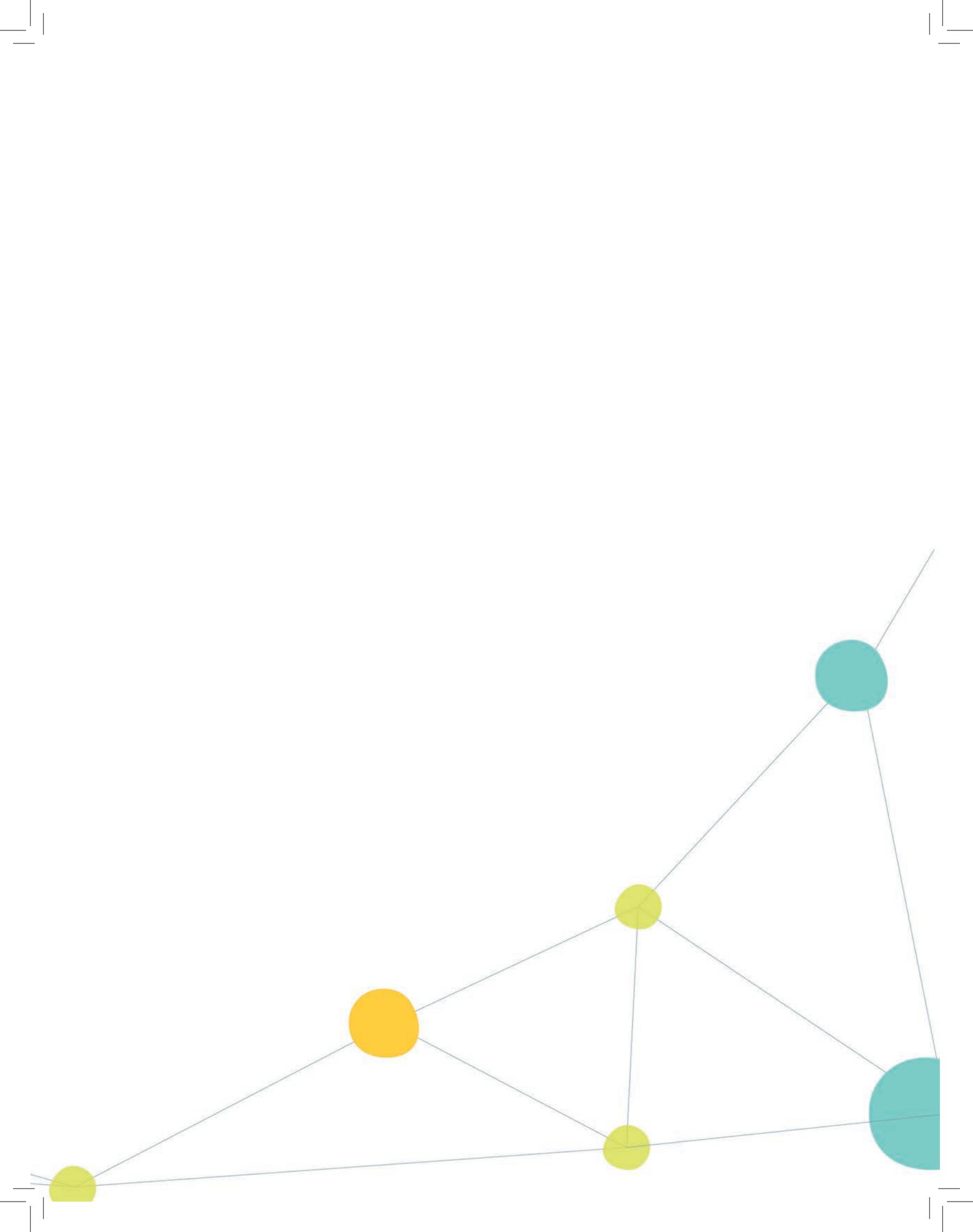
## Dan Epstein

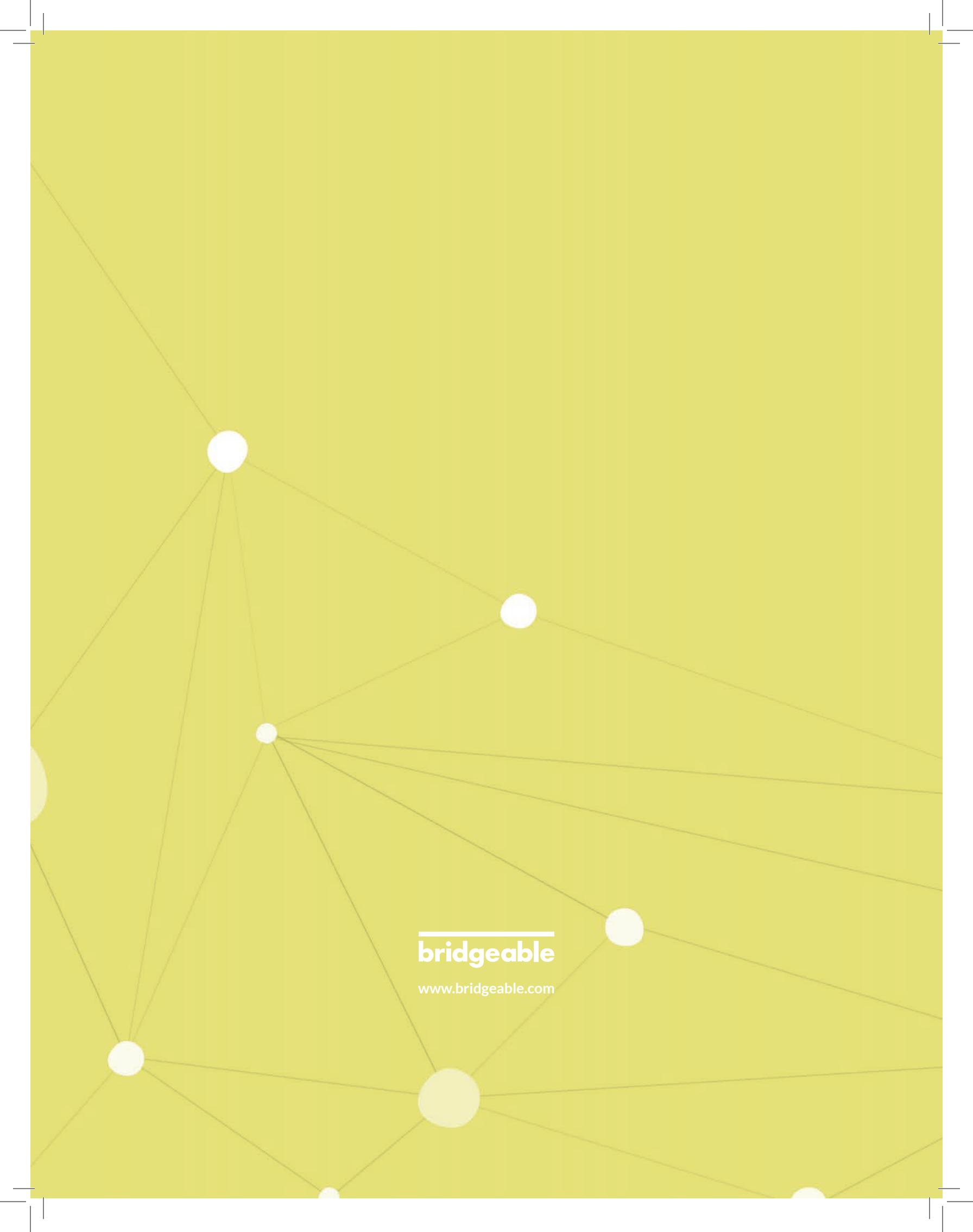
*Documentarian*

Coming from a photography and film-making background, Dan has created a number of documentary projects including Crisis of Distrust (2014) and Defenders (2013). His work has been featured by Canadian Art, VICE, CBC, and Huffington Post. He's passionate about creating social change through service design and innovation.

"This summer I learned a lot about the design process and how to tell design stories. I also learned how effective interviews with research subjects can be. I was surprised to find out that some of the videos I cut would be seen at the Ontario Ministry of Health. I'm so excited for these amazing mothers' voices to carry through as MaRS realizes this project."







**bridgeable**

[www.bridgeable.com](http://www.bridgeable.com)