Overview

“Helping children manage their diabetes in a fun and engaging way”

- Focus is towards improving the experience of kids aged 8-15 with Type 1 Diabetes

- Redesigning current technology like the OmniPod
Problems and Solutions

Problems

– Managing Diabetes can be scary and daunting
– Many things to keep track of at any given time--stress
– Current interfaces are not particularly user friendly, let alone kid friendly

Solutions

– Use positive reinforcement and rewards
– Education for better management and necessary skills
– An intuitive interface that makes monitoring your blood sugar easier
Participant 1: Mother of a Stanford Student with Type 1 Diabetes
- Homemaker
- No immediate family with Type 1 Diabetes
- Worried that daughter may also be susceptible → gets her tested
- Helps make decisions about diabetes care

“A Mother’s Glimpse of Hell” by R.H.
Contextual Inquiry

← Supply drawer with PDM, insulin pump, glucose test strips

← Book to help count carbs
Contextual Inquiry

Participant 2: Son of the previous participant, Stanford senior with Type 1 Diabetes
- Was diagnosed when he was 12
- Uses a wireless pumping system and must test his blood sugar periodically
Omnipod
- Tests blood sugar
- Has some short term records for blood glucose (bg) levels
- Recommends/administers units of insulin based on blood sugar and when you eat
Participant 3: Junior at Stanford with Type 1 Diabetes
- Female, diagnosed at 6
- Uses a system that consists
  - continuous glucose monitoring device
  - blood sugar test kit
  - insulin pump
Contextual Inquiry
Task Analysis

1. Who is going to use the system?
   - Children who have recently been diagnosed with diabetes

2. What tasks do they now perform?
   - Checking blood sugar
   - Counting carbs
   - Administering insulin (with needles or pump)
   - Replace insulin
   - Strategically eat snacks
   - Keep track of supplies
Task Analysis

3. What tasks are desired?
   - Easy way to count carbs
   - Precise/fast way to keep track of blood sugar trends and administer insulin

4. How are the tasks learned?
   - Under guidance of doctor
   - Parents
   - Flashcards for counting carbs
   - Counting carbs with book
5. Where are the tasks performed?
   - Everywhere (at meals, gym, school, work, home, etc)
6. What’s the relationship between customer & data?
   - Customer and doctor/parents must keep track of long term trends
7. What other tools does the customer have?
   - A way to deliver insulin (shots or wireless system)
   - A way to look up carbs either through search engine or book
8. How do users communicate with each other?
   - In-person/online diabetic communities
   - Diabetes camps

9. How often are the tasks performed?
   - Testing blood sugar at least before each meal, after physical activity, anytime the patient feels ill
   - Bolusing for each meal or snack
   - Counting carbs for each meal or snack
10. What are the time constraints on the tasks?
- Must test for blood sugar before every meal and before sleeping
- Must bolus for insulin immediately before/after eating

11. What happens when things go wrong?
- Must be hospitalized if blood sugar is extremely low or high→ patient is unconscious
  - Glucagon pen to increase blood sugar when patient is suffering from low sugar
  - 911 if unresponsive
Representative Tasks

1. Checking blood sugar (simple)
   - Fast (once you are used to it)
   - Needs to be done several times each day
   - Must eat snack or cut back on insulin when blood sugar is low
   - Must drink water and take more insulin when blood sugar is high
2. Counting carbs (moderate)
   - Needs to be done when eating/snacking
   - Requires practice
   - Can cause anxiety
   - Can be imprecise
Representative Tasks

3. Administering insulin/bolusing (complex)
   - What have you eaten?
   - What was your blood sugar previously?
   - What activities will you be doing later?
   - What amount of insulin do you need?
Application Ideas

1. Social Network
   - Give diabetics an opportunity to connect
   - Advice and tips
   - Sharing progress and victories
   - Diabetes memes
2. Artificial Pancreas

- Work with system that constantly monitors glucose levels and adjusts insulin doses
- Graphical user interface
  - visually displays information collected
  - projection on arm?
- Alerts when something needs to be adjusted
3. Integrated Management System
   - Educational/motivational games
   - Teach you the skills you need to manage diabetes (ex: when to check bg, carb counting)
   - Positive reinforcement → rewards for good blood sugar levels
UI Sketches

Points: 89

Games

Measure blood sugar
Carb Counter
Deliver bolus
Help

Trend
We've noticed
Try
suggestions

Individual counts for item

Earn coins

Carb counter

Total

Tips here & encourage

Points: 89

How many carbs? (in grams)

5, 20, 40, 80

Points win for every right one
Avatar shows helpful tips
Food on a plate (calories)

Multiple choice
UI Sketches

Points: 100

Level Complete!

50% off Sprinkles
Summary

- Application that simplifies daily tasks
- Use games to teach diabetic children necessary skills in a fun way
- Positive reinforcement to relieve stress related to managing diabetes