Project name

Dell is the #1 IT Healthcare service provider in the world. What if they could do more? What if they could harness data and make meaning? What if they could redefine the hospital experience? What if they could change peoples lives for the better? That's what we set out to explore. While we found many problems in the healthcare space, we decided to focus on the communication aspect between medical professionals and patients.

Vision

• 'Build Future-Ready IT Platforms: Systems should be capable of adapting to change, scaling and achieving maximum efficiency.

• Unlock Information: Data must be free from the shackles of paper and from digital silos, with secure access when and where it is needed.

• Empower Caregivers: Caregivers need technology and process, including real-time clinical decision support and operational insight.

• Unleash Innovation: Investments in technology and process will yield significant returns in the form of efficiency and quality of care.

Service

Mobile clinical computing for clinician efficiency

- Cloud client computing
- Desktop virtualization (collaboration with citrix)
- Horizon view (collaboration with vmware)
- Microsoft remote desktop service x dell vworkspace

Cloud based EMR record

- Implementation / optimization / support
- Dell drive solution
- Healthcare information system (end-to-end solution for clinical, operational, financial goals)

Quality care service / analytics

- Emr optimization
- Clinical consulting
- Emr implementation

Security for electronic medical record (EMR)

- Encryption
- Mobile clinical computing
- Automated security maintenance deployment
- Zero touch desktop virtualization

Healthcare cloud (emr)

Product

a. medical cart / wall mounts

b. medical displays

c. computer for mobile cart

d. medical computing (tablet)

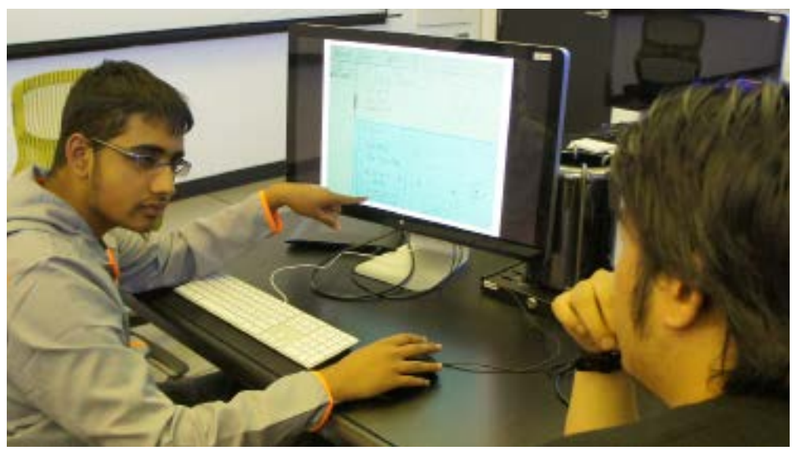
e. barcode scanner

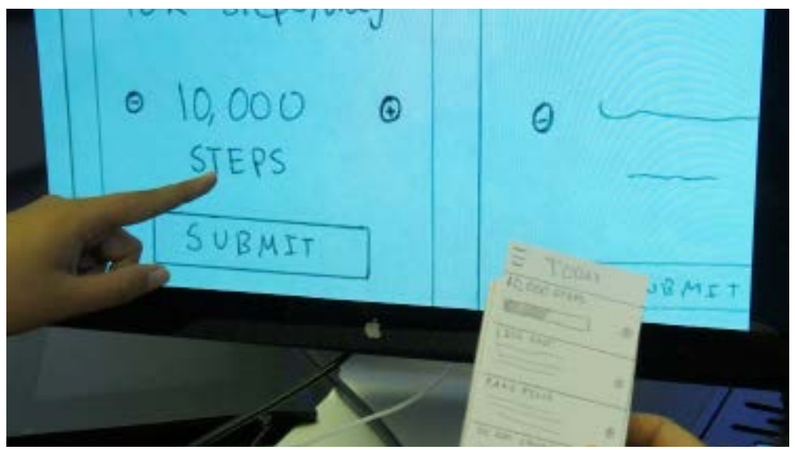
f. healthcare purpose-built accessories

g. remotescan enterprise

Scenario 1

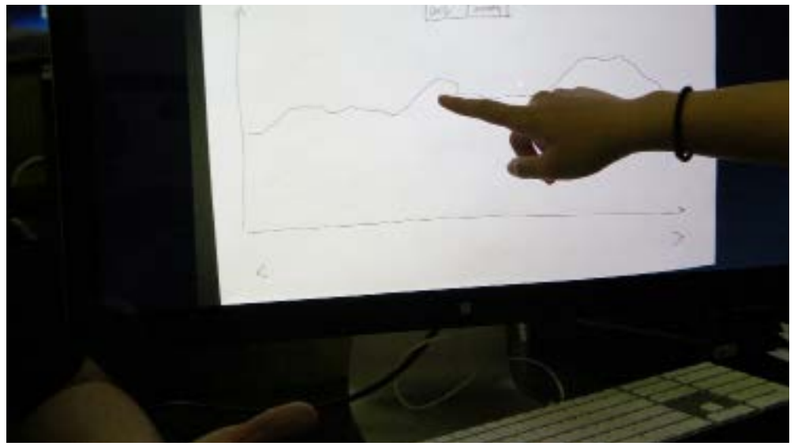
Collaborative Goals comes from the thing every doctor says at the end of an appointment. “Lets work towards …” You both acknowledge it, but very rarely do those goals succeed. This concept looks at creating a collaborative goal system between you, your doctor, and your close family to help change and better your lifestyle.

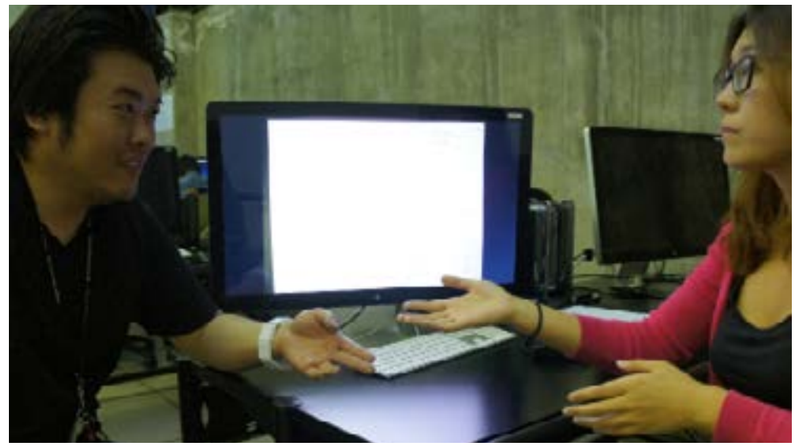




Scenario 2

Snapshots is based on the fact that doctors need to know more about a patients lifestyle to make an accurate diagnosis. When they see the patient in the room, thats only 1% of the information. This concept explores using a device to collect data from the patient, which the doctor then has access to.





Interview

Byung-woo Yoon M.D. PhD.

Difficulties in facing patients

"Face to face time with the patient is limited, therfore the information we can obtain regarding the detail of the patient's habit and lifestyle can be either inaccurate or limited as well."

"Patients often face difficulties in keeping their direction in terms of diet and medication schedule, which makes it difficult for the doctors to proceed with further procedure."

Pain Point & Criteria 1

Pain Point

Patient's noncompliance causes issues for the doctor to proceed with further treatment.

Criteria

- Doctor and the patient agreeing upon the desired goal; bi-directional communication

- Setting a clear guideline for the patient in terms of taking medication and diet

- Providing support for the patient while they are being treated

Pain Point & Criteria 2

Pain Point

Short face to face time with the patient does not give enough information about the patient.

Criteria

- Easily record the patient's overall lifestyle

- Non-intrusive to the patient's lifestyle

- Immediate access to the data

Pain Point & Criteria 3

Pain Point

Doctors deal with massive amount of data which can take a lot of time to interpret

Criteria

- Improved readability of the data

- Easy to analyze the data

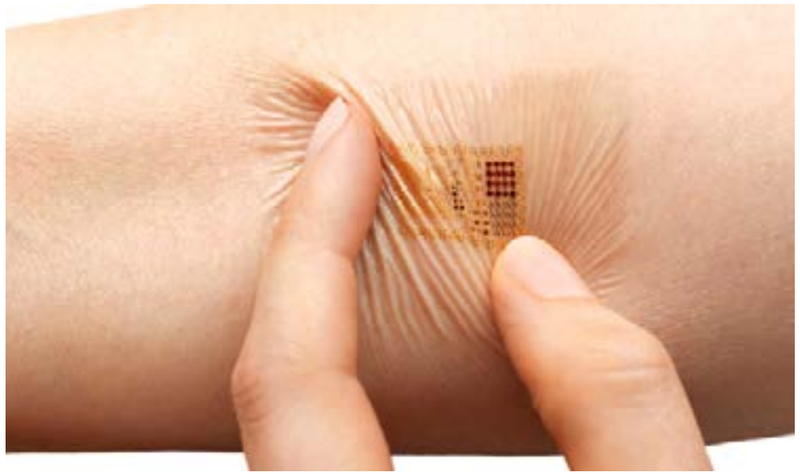
- Easy accessibility of the data

Research

Robin Berzin M.D.

"When somebody comes into my office I get this one minute look at what their life is like. I get their vital signs. I get a certain gestalt what their what's going on with them whether they're doing well whether they're doing poorly but I don't know what the other 99 percent of their life looks like."

Tech Trends

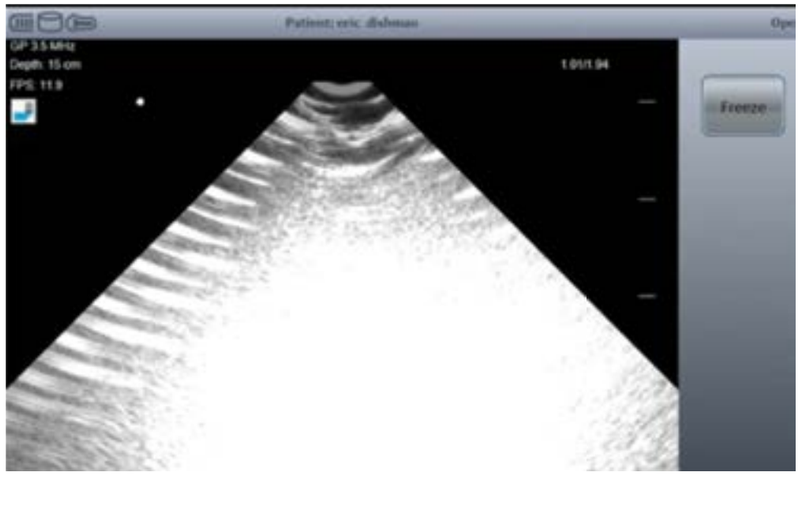


Stretchable electronics that you can stick to your skin. Can be taken off easyly, hidden under clothes. Few years out. Much smaller footprint. Can have various that monitor various parts.

Non-invasive tech method to detect and monitor a patients O2 saturation levels. Becoming a little more common in current wearable devices. Data that doctors would appreciate.

Liquid repellent nano coating. Could pave the way for fabric based wearable devices.

○ Sociocultural Trends



acor.org
Association of Cancer Online Resources

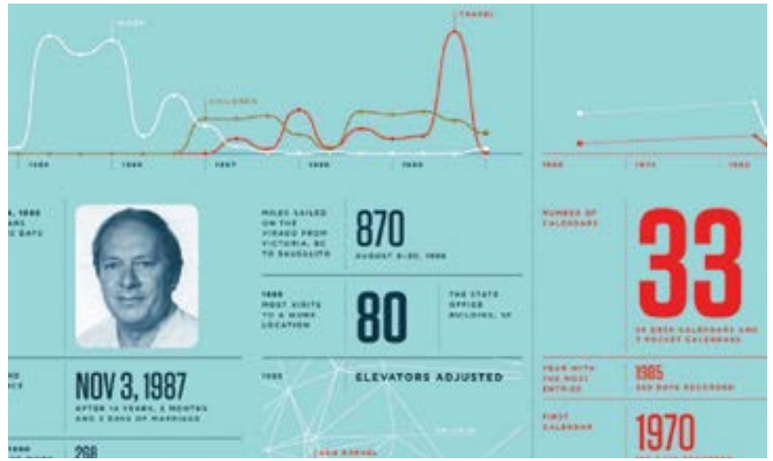
Communication with your doctor anytime, anywhere as if there is the device can send the data to the doctor.

Community where the patients who have the same symptoms.

Design Trends

Result or feedback is easy to understand by patients. No more terminology or gives explanations to the terminology. Let the patients engage more in treatment.

Portable, personal use devices. Users can record some health data at home everyday according to the doctor's demand. Those devices is for home use,



Personalize record for patients. Those records can refelect the medical history of the patients.

○ Competitor

Ambulatory Blood Pressure Monitor

Strength

Able to maintain normal lifestyle and routine

Weakness

limited function compared to the size of device

Wireless Ambulatory ECG

Strength

easy to access the data fits under the user's clothes

Weakness

-automatic update to the cloud can cause security issues
-one dimensional monitoring

○ Competitor

Fuel Band

Wireless Ambulatory ECG

Strength

- stylish and ts to the normal lifestyle
- can be used as a collaborative tool.

Weakness

- inaccuracy of the data
- limited to casual tness data

Moticon

Strength

- useful tool for rehab and training
- can blend in very well to anyone's lifestyle

Weakness

- more focused towards skiing

Positioning Matrix

Fitness

Various Data

Opportunity

Health

Focused Data

DELL

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Medical Market

The global medical device industry is growing rapidly, with value expected to hit **$228 billion** by 2015, up from $164 billion in the year 2010, marking annual growth of nearly 7%

The market for mHealth app services will reach **$26 billion** by 2017

Wearable medical devices market is expected to reach **$5.8 Billion** globally in 2019

01

Interview 1-1

Zhuo Min

Endocrinologist

Process of seeing a patient

1. Check the result of test 2. Ask the symptom of patients
3. Give diagnosis according to the test and answer
4. Give perscription to the patient

Device/Tools

1. Stethoscope 2. iPhone 3. iPad

Summary

She is an endocrinologist with a lot of experience in diabetes. In this interview, she has three main problems when treating the patient: first is the patients know nothing about the disease, so she have to spend a lot of time explaining and answering the questions. Second is the patients look up the symptoms online and will argue with the doctor. Third is some patients cannot follow the instructions that she gave.

05

Personal Workspace 1

1. Test strips(needle), the lancing device the monitor

2. Put the test strips into the lancing device

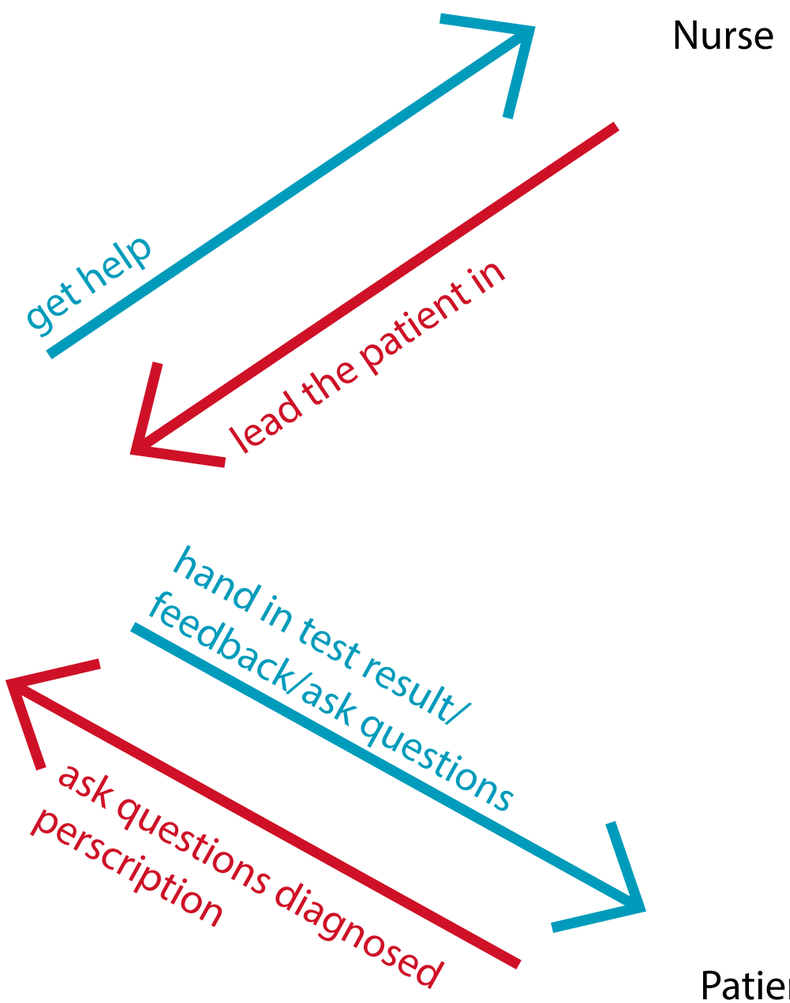
3. get the blood

4. put the blood on the test paper

5. waiting the result

02

Eco-system within the hospital 1

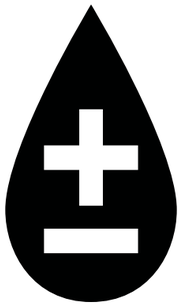


03

Painpoint and Scenario 1-1

"Knowledgeable" and "know nothing patients

Some patients don't know anyting about the illness will take a long time for doctors to explain to him some patients looked up online and have different opinion with the doctor even arguing with the doctor.



Taking several test(blood pressure, blood sugar, blood fat)

get the result

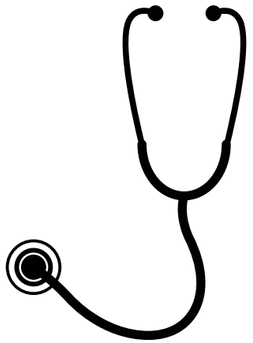
There is a report along with the test-- by the comprehensive comparison of various parameters, the report will show the basic analysis of the symptom.

04

Painpoint and Scenario 1-2

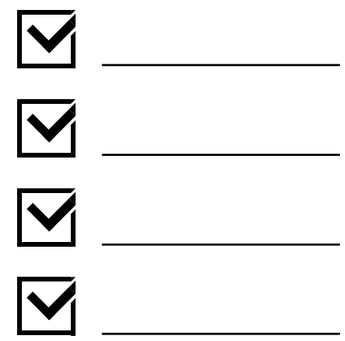
Follow the instruction

Some patients don’t do what the doctor tells them, they often forget what the doctor tells them.



doctor give the diagnosis

doctor make the plan for the patient



Patients get reminds everyday for what they should eat, what time should exercise.

01

Interview 2-1

Bob Huang

Engineer
53 years old

Second type diabetes
4 years of treatment

Medical process

1. See the doctor once a month
2. Take blood sugar test every week
3. Take 1 pill per day
4. eat vegetable only

Device/Tools

1. Accu-Chek Blood Glucose Meters
2. Omron Blood Pressure Monitor
3. iPad/iPhone

Summary

She is an endocrinologist with a lot of experience in diabetes. In this interview, she has three main problems when treating the patient: first is the patients know nothing about the disease, so she have to spend a lot of time explaining and answering the questions. Second is the patients look up the symptoms online and will argue with the doctor. Third is some patients cannot follow the instructions that she gave.

02

Eco-system within the hospital 1

Tester

Get test(through instrument)

Give back the test result(paper with complicated data)

Nurses

Get appointment

call the number

Bob

Give perscription(digital and paper)

Give medicine

Pharmarcy

Give feedback ask questions

Ask questions diagnosed perscription

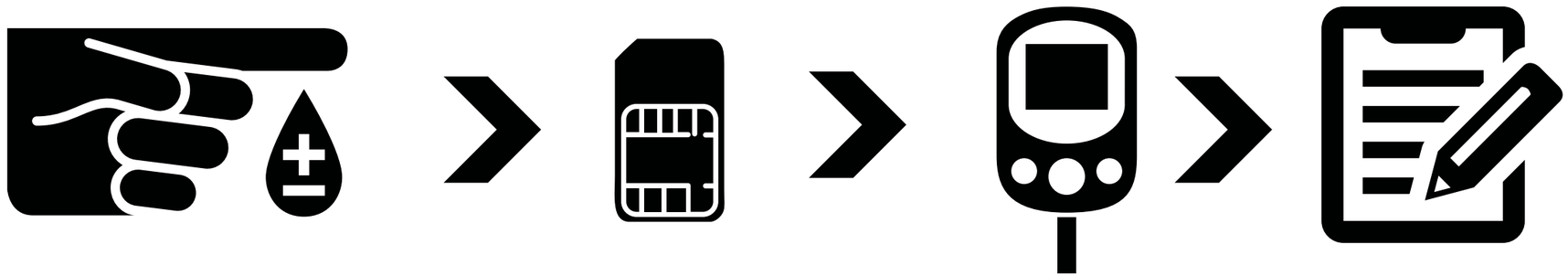
Doctor

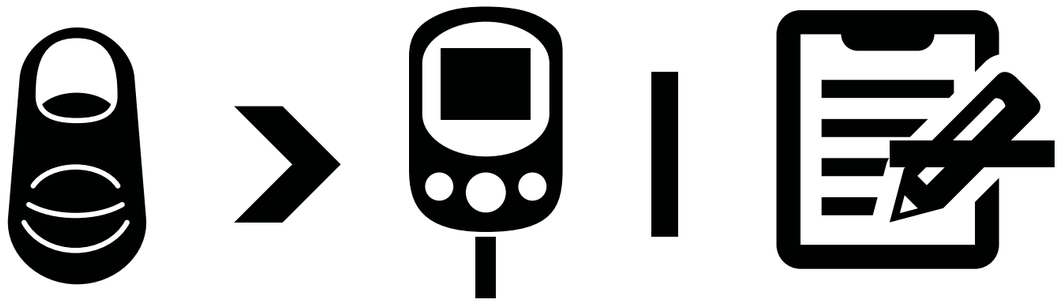
03

Painpoint and Scenario 2-1

Long process of checking blood sugar level

Each time of checking blood sugar level has to go over through 3 to 4 steps with using 7-8 supplies. blood test instrument , insulin(syringe) , needle, pills,blood sensor, etc.





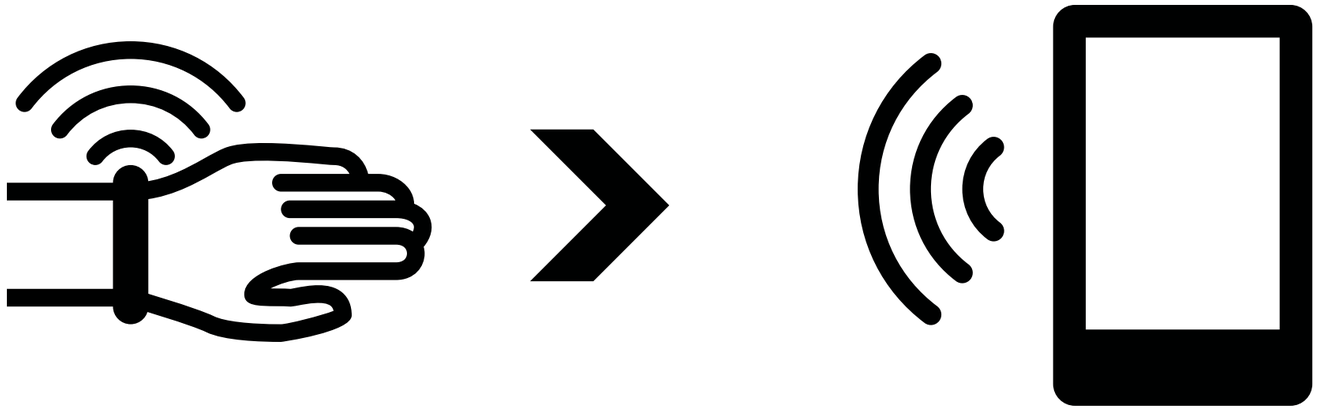
Scenario : there is a deivce that can one way to check blood sugar level without going over through of many steps.

04

Painpoint and Scenario 2-2

Accuracy of monitoring blood test.

Often times the monitor of blood testing keep showing the error sign.
Patients have to keep press out their blood over and over again.



Wearable Device gives you accurate blood glucose without your blood drop. Also you don't need to plug in your test strip into monitor.You can monitor through your smart phone or tablet devices with wireless technology.

01

Interview 3-1

Jee Park

Chef
50 years old

Diabetes for 3 years

Medical process

1. See the doctor once every 3 months
2. Buy tools/supplies every 3 months/ cost $300 dollars
3. Take 4 pills a day - at morning and night
4. Blood check everyday and insulin once a month

Device/Tools

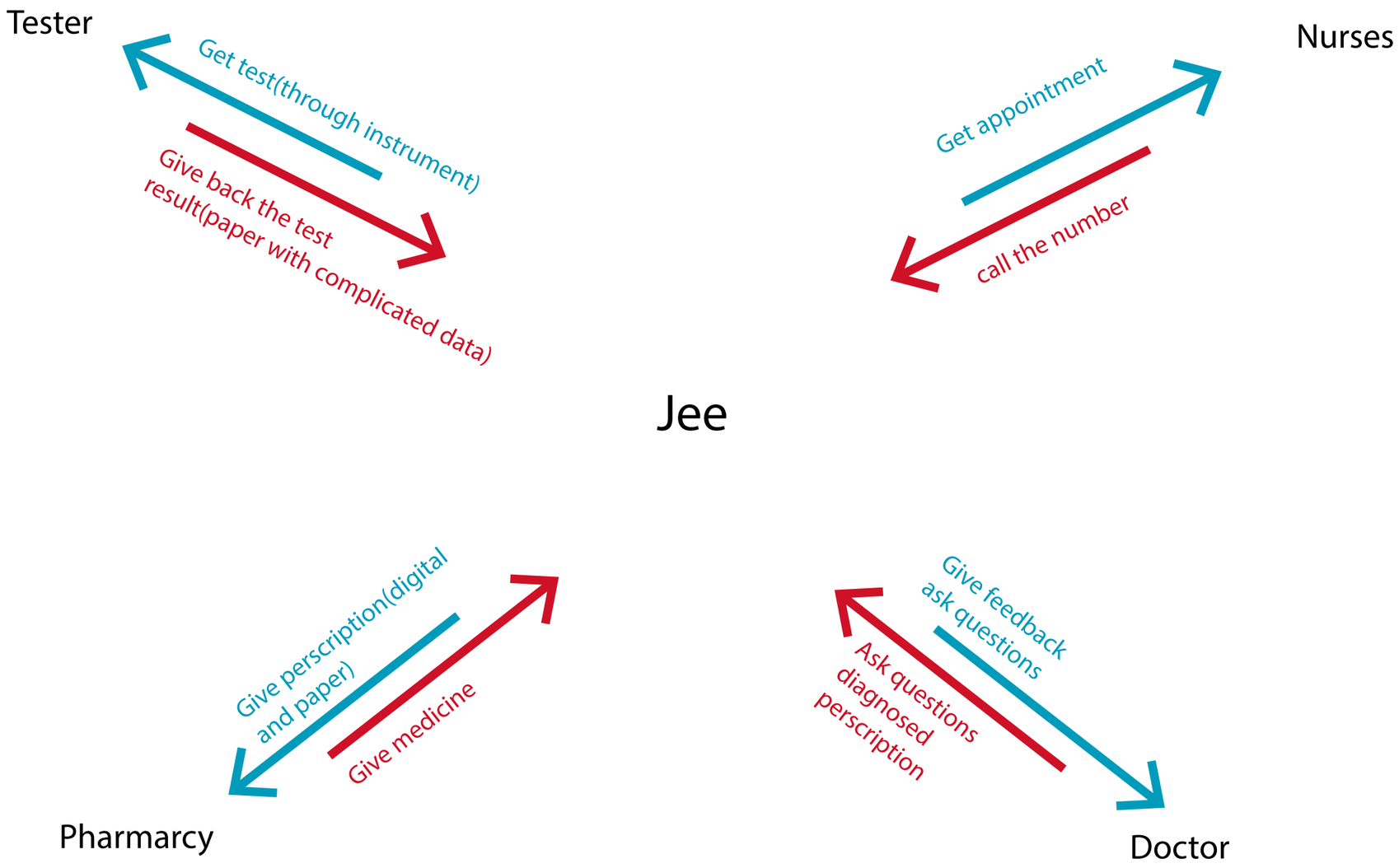
1. Relion Blood test monitor, Insulin, pills, needle, test strip,

Summary

Jee is 52 years old and having diabetes for 3 years. She spoke out the problems about how diabetes impact on her daily life. She also complained about the cost of supplies for diabetes. Her eating habits, amount of exercise, and lifestyle changed since she had diabetes.

02

Eco-system within the hospital 3

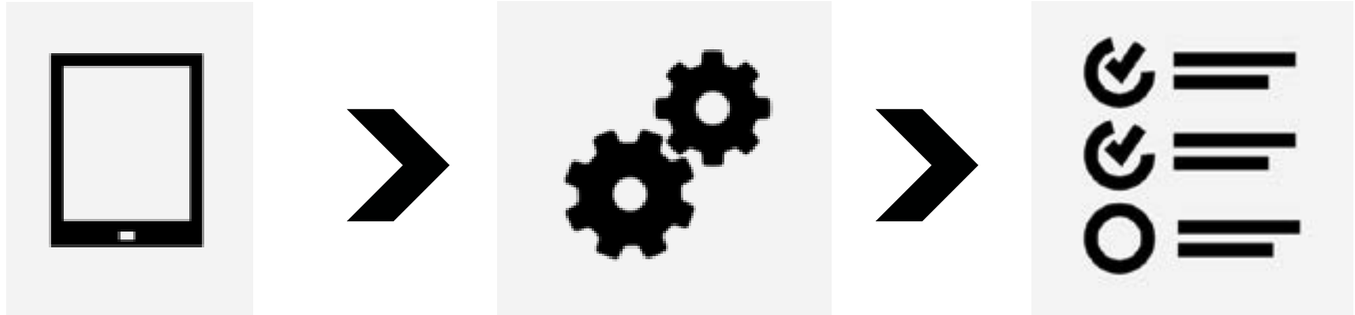


03

Painpoint and Scenario 3-1

Transportation problem

1 they have to discuss their travel plan with their doctors
2 packing the proper amount of diabetes medical supplies
3 if they traveling by plane, they have to keep their diabetes kit close by them at all times.
4 Long time flgiht need more insulin than usual, short time flgiht need less insulin than usual.
5 They need to adjust their insulin injection scedhule.



Device that could plan out injection/take pills schedule without discussing with doctor. If you have long time fligt, this product will calculate the time, blood sugar level, and how much you need pills/insulin and notices you what time you have to take pills or inject with an insulin.

04

Painpoint and Scenario 3-2

Inconvenience in public place

it’s too much of hassle and it draws a lot of attention.

A device that notice you in 3 differnet signs blood sugar ok, warning , alarm through your smart phone

it will navigate you the location and it will guide you where you can comfortably inject an insulin without attention.

A wearable device that has sensor and the vibration notice you when your blood glucose is very high. user can just press the button that has insulin needle and inject it secretly.

05

Personal Workspace 3

Too many tools to carry

It cost more than $100 dollars

It keep shows error sign

Pill is too big to swallow it

these are the waste
because of blood glucose
monitor didn't work well

these are disposable
if these are not organized
well, very hard to recognize
which one is new/used

01

Interview 4-1

Joseph Im

60 years old

Medical process

1. Meet with doctor every 3 months
2. take 2 pills a day and 4 insulins
3. Use medical insurance for supplies
4. Blood check everyday

Device/Tools

1. Insulin, 4 differen kinds of pills, blood test monitor, needle, test strip, Meter,

Summary

Joseph is 60 years old and having diabetes for 32 years, which means he's now specialist of his diabetes care. He's using more pills and insulins than other diabetes patients. He spoke out some problems about how painful injecting with an insulin(syringe) 4 times a day. Also using an insulin in pulic placse, it draws a lot of attention.

01

Who, What, Why

What

While todays medical technology is advancing fast with various pieces of equipment that can measure patients data, there is still a vastly underutilized source, the patients themselves. Seeing a doctor comes with many challenges like the long waits, the difficulty in conveying your systems, the doctor tracking your live health data, and of course understanding those complex test results with all sorts of terminologies. The low efficiency of the health care industry is caused by a large communication gap between doctors and patients. While the medical industry requires a high level of skill to understand, patients have a right to understand their health condition which can be parsed from complex data sets. Let's allow the patient to truly be a part of the treatment process.

Who

The people who have type one and type two diabetes. When people get the diabetes, it will follow you the entire life. The patients should monitoring their blood sugar level all the time, get diet and do more exercises.

Why

According to the American Diabetes Association, 25.8 million people in the US su er from diabetes. An estimated 10 percent to 20 percent of cases are misdiagnosed, which exceeds drug errors and surgery on the wrong patient or body part, both of which receive considerably more attention. One report found that 28 percent of 583 diagnostic mistakes were life threatening or had resulted in death or permanent disability.

Another study estimated that fatal diagnostic errors in U.S. intensive care units equal the number of breast cancer deaths each year -- 40,500.

why misdiagnosis

Problems with ordering diagnostic tests.
Failure by the patient to provide an accurate medical history.
Errors made by a doctor in interpreting test results.
"it's important for doctors to take the time to do a thorough exam, listen to their patients and talk about their health concerns."

01

Technology 1-1

Optical Character Recognition

What

Context aware software that can convert raw handwritten text, or text from an image into a digital medium.

Who

Siemens: Front-runner with technology, various smaller 3rd party software providers. There are also providers like Evernote and Modnotebooks who have started offering digitization of notebooks as a service.

When

Available today, expanding to other industries.

Commercialization

Available as a software. Not a large need for consumer based devices. Services like Evernote and Modbooks have started offering services to digitize notebooks. Problems with that include the high cost and turnaround time upwards of a week.

Example application

A device that can track writing over various services. Attach it to a small notebook, then to a table, and a whiteboard. Just one device to capture content across various mediums and convert into a digital format.

02

Technology 1-2

Low-Energy Bluetooth

What

This new bluetooth standard allows for low power bluetooth technology which enables use cases like finding files, etc. Can be powered for months without replacing the battery.

When

Available now. Various 3rd part solutions, and custom systems available.

Commercialization

Integration into products has been the challenge...products are adopting, customer adoption is slow, but on the up and up.

Who

Accent Advanced Systems, Laird, Mercury Development, Texas Instruments.

Example application

Lost your folder, find it with your phone, or any device.

03

Technology 1-3

[redacted]

Gyricon

What

Electronic paper Xerox PARC

When

Tight on details, looks like it is available for licensing only now.

Commercialization

Not brought to market yet, or in use for secret corporate projects. Hasn't become mainstream with the consumers.

Who

Xerox PARC experimental technology that is available for licensing.

Example application

a notebook/paper type to which you can stream digital content. Write in it and convert that to digital media.

01

Technology 2-1

New breathalyzer 'monitors blood glucose' in diabetics

What

A novel noninvasive breathalyzer device that can monitor blood glucose levels in diabetics. This is according to research presented at the 2013 American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition.

Who

Ronnie Priefer, of Western New England University, Spring eld,

When

late next year and early 2015 will see the device being control tested by two clinics from Western New England University

02

Technology 2-2

Afrezza: An Ultra-Rapid-Acting Inhaled Insulin

What

The system delivers what the company calls an “ultra rapid-acting mealtime insulin therapy” to be taken in conjunction with food by either type 1 or type 2 diabetics. The inhalable powder is delivered in premeasured, single use carridges y using a proprietary inhaler that ts comfortably into the palm of your hand

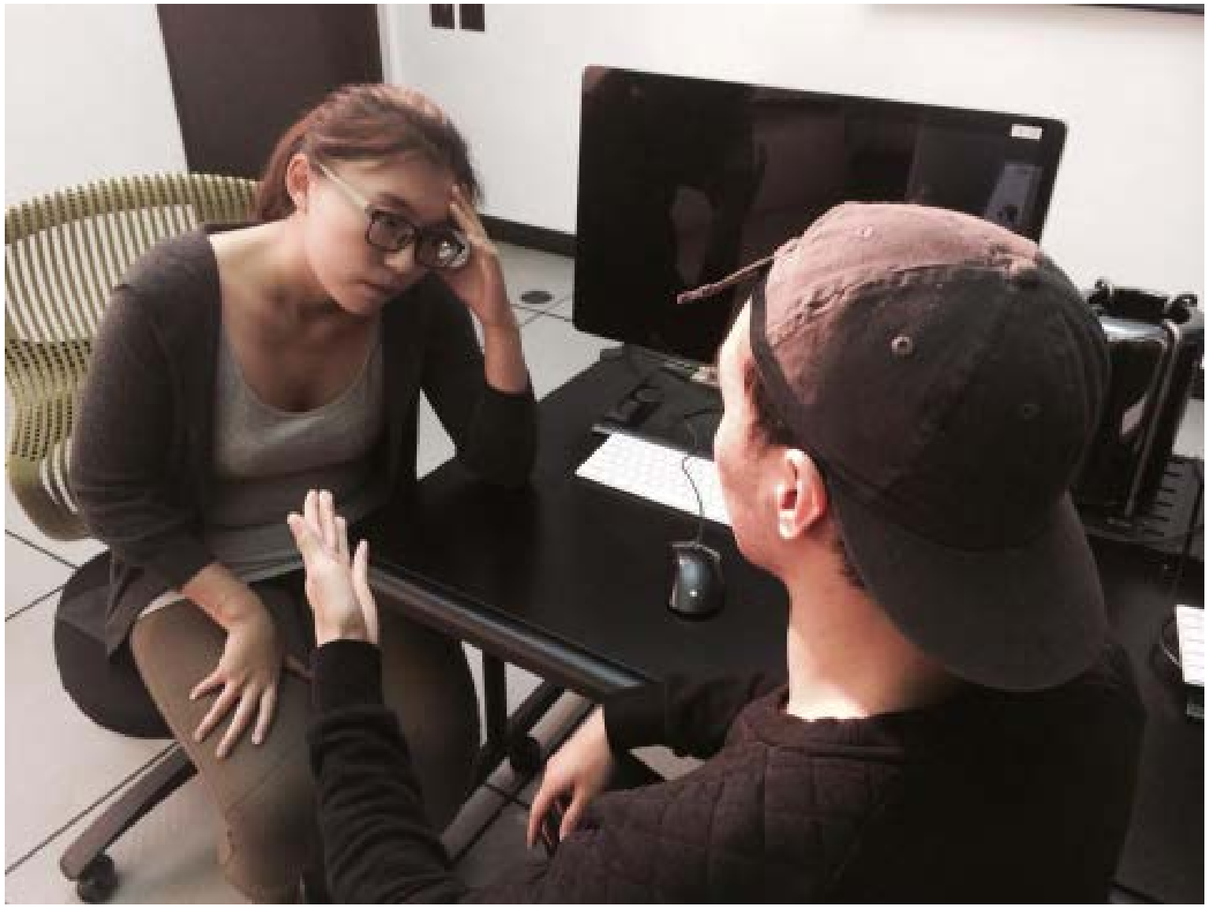
Who

Mankind corperation

When

MannKind resubmitted it’s New Drug Application to the FDA in October and the FDA is expected to nish its review of Afrezza by April 2014.

○ Problem Scenario 1-1



Claudia doesn't feel well lately, so she goes to doctor Will to find out what happened to her. After all the test, doctor tells her that she has type two diabetes. Claudia feels sad.

Doctor Will asks Claudia to come to his lecture about diabetes. In the lecture, Doctor Will basically just talking in front of the room. Claudia feels boring.

○ Problem Scenario 1-2

When Claudia goes out from the lecture, she cannot everything doctor said and still have some questions. She feels confused and depressed.

Doctor Will asks Claudia to eat healthy, but for Claudia, she cannot change her eating habit in few days. Sometimes she will eat unhealthy food that is forbidden by doctor Will.

○ Problem Scenario 1-3

Claudia cannot get well, her blood sugar is still high, she often feels tired, she don't know what to do to control her diabetes. She gets depressed.

She goes back to the doctor Will's office. Doctor will get angry at Claudia that she didn't do exactly what he told her.

○ Solution Scenario 1-1

Claudia is a type two diabetes patient that suffers from the disease for 5 years. She lives alone in a small apartment located in Pasadena. She has to inject insulin everyday and suffers from the complications. She always feel lonely and gets depressed. She is not feeling well right now.

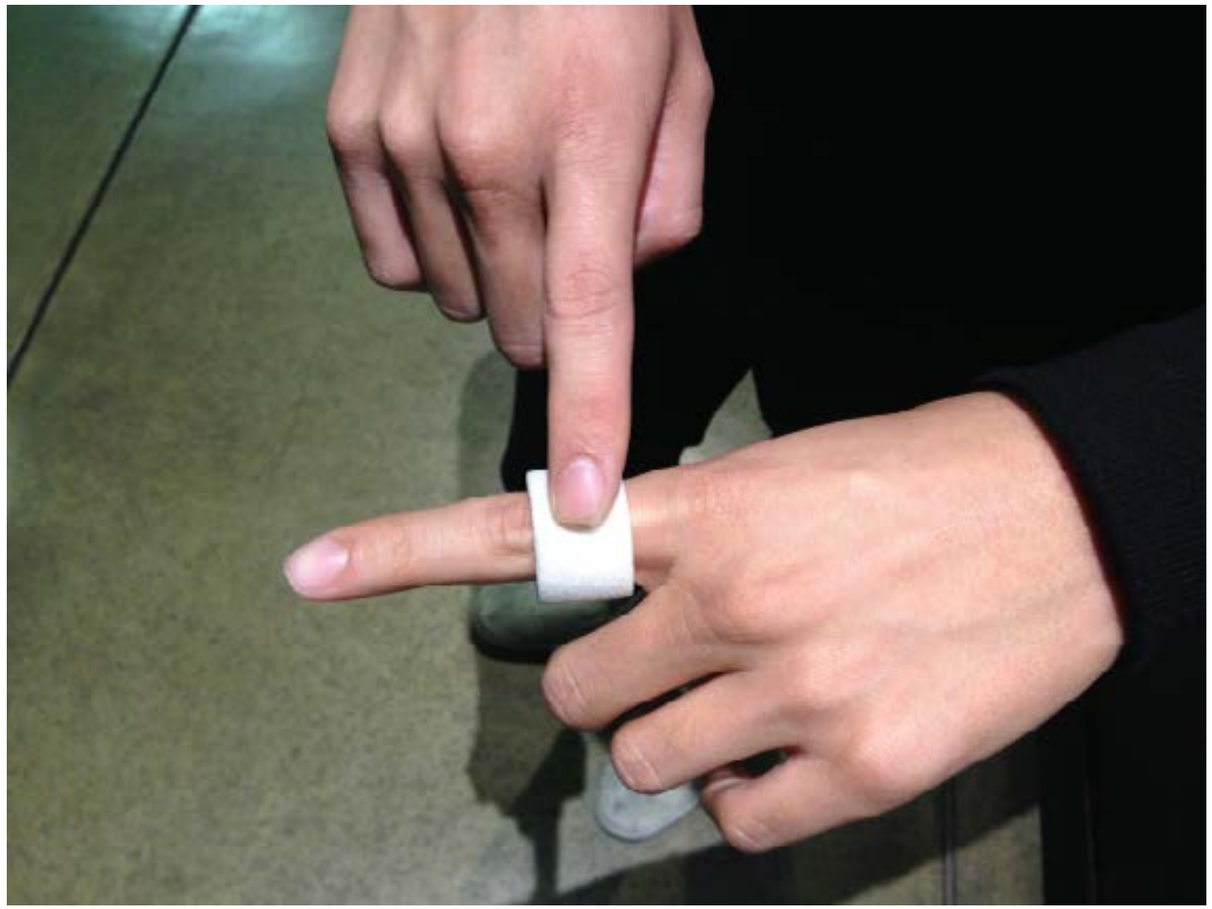
She rotates the ring to notify will who is far away from where she lives. When the ring senses the rotation, it will send out the signal to will.

○ Solution Scenario 1-2

Will is a diabetes patient too. He and claudia are both volunteers of the program that taking care of the lonely people who have diabetes. Will is buying something out of the vending machine.

Then he feels his ring cools down. It's the sign that claudia is depressing right now. She needs someone to comfort her.

○ Solution Scenario 1-3



Will wants claudia to feel she is not alone, so he rub his ring. When he rub the ring, the ring will sense it and send the signal to claudia.

That's claudia in her apartment, still feels depressed.

○ Solution Scenario 1-4

The ring receive the signal of will's ring, it starts to warm up, she feels the temperature.

Claudia knows she is not alone, there is someone have the same symptom with her and want to comfort her. She feels better now.

Setting Goals

○ Problem Scenario 2-1

patient goes to the hospital for his checkup and gets direction from the doctor

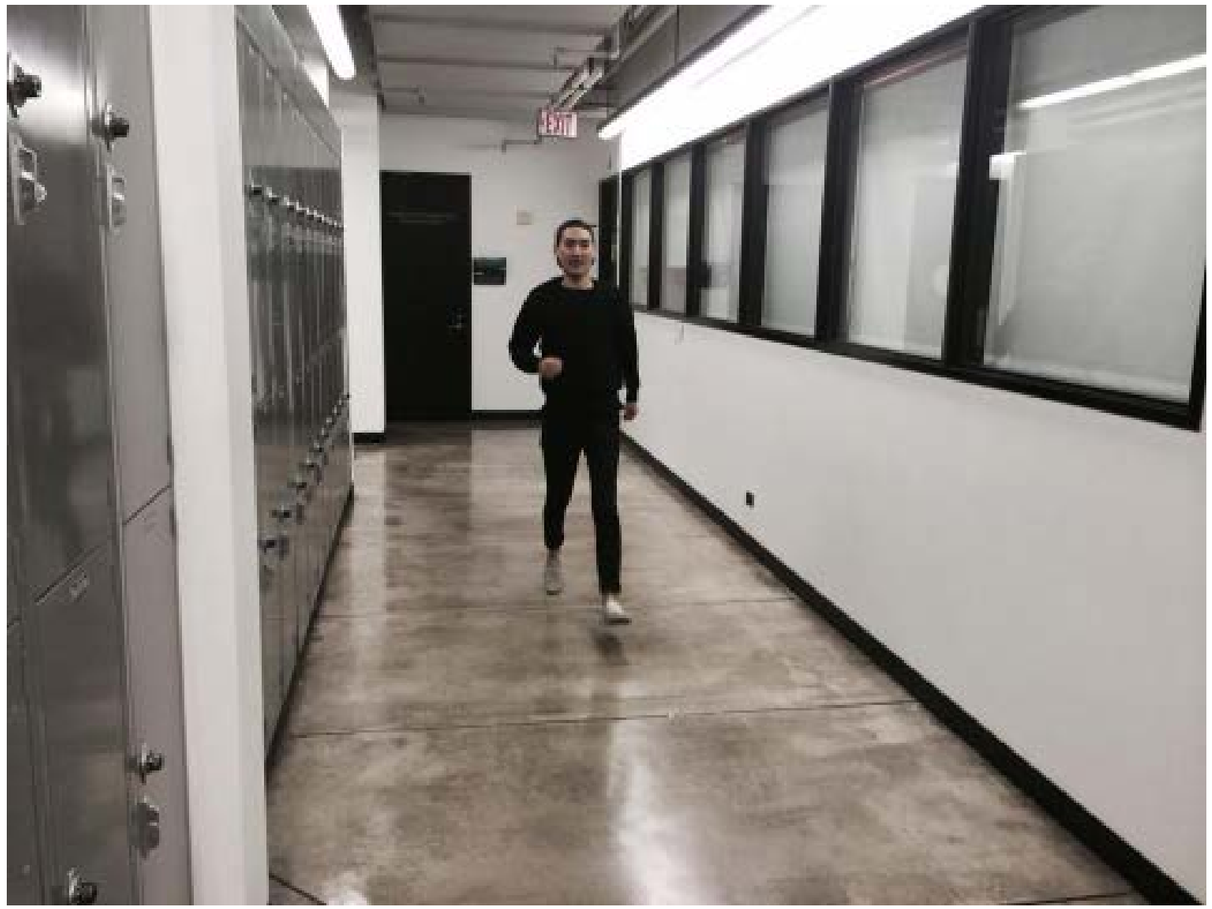
he buys the medication and necessary tools to treat himself until the next appointment

○ Problem Scenario 2-2

patient takes pill

eats healthy

○ Problem Scenario 2-3



exercise

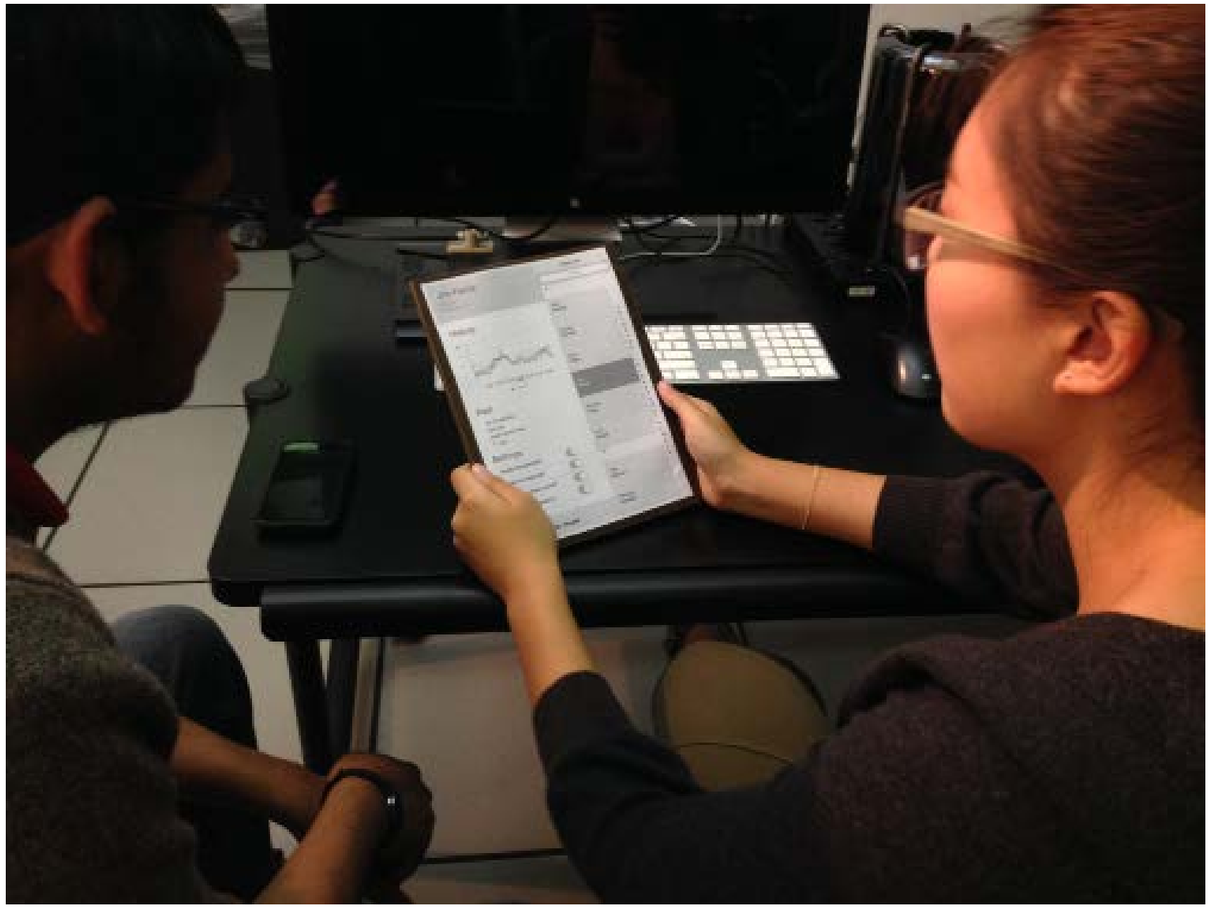
but it doesn’t last consistently

○ Problem Scenario 2-4

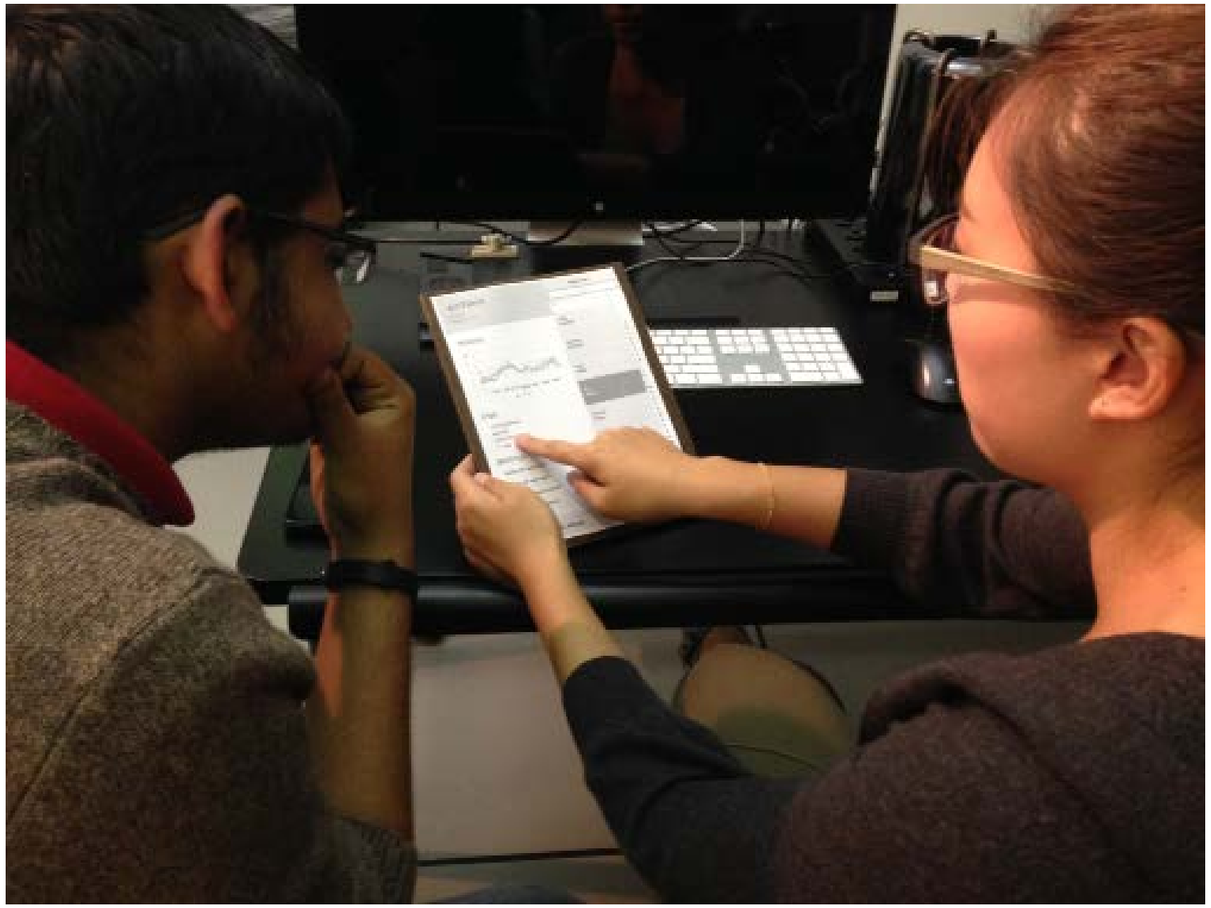
patient falls into bad habit

doctor is not happy about how patient managed himself

○ Solution Scenario 2-1



Hari is a diabetes patient that suffers from the disease for 1 year. He would like doctor Wang to make a plan that can help him control the diabetes. Today, Hari is on doctor Wang's office, and doctor Wang shows Hari his history of blood sugar level



Then Hari and doctor Wang make the exercise plan, diet plan, pill taking plan together.

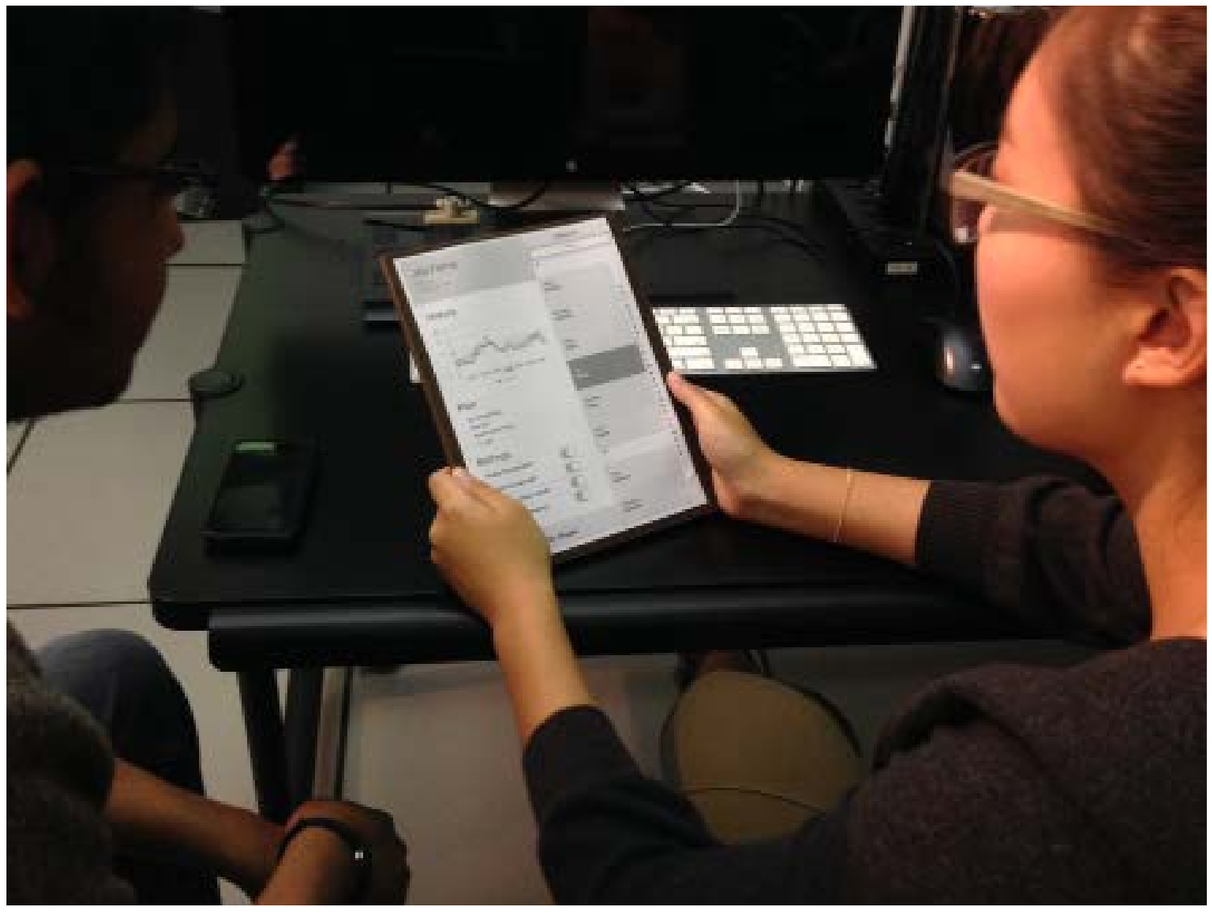
○ Solution Scenario 2-2

Doctor Wang sends the plan to Hari's phone, so that Hari can follow doctor's instructions

Then Hari will take blood sugar test everyday and rocod that to the phone, so the doctor can view the history of Hari's blood sugar level and see how is the plan work well.

○ Solution Scenario 2-3

When Hari done with the blood sugar test mission, he check the mission and the mission is done.



After two weeks, Hari comes back to doctor Wang'a office, Doctor Wang check his history blood sugar level and how Hari finish his missions every-day. Then they can come up with new plans according to the previous be-haviour.

Diabetes 101

○ Problem Scenario 3-1

Patient has just been diagnosed as type 2 diabetic

He is not clear with the direction that he should follow

○ Problem Scenario 3-2

Patient has difficulties adjusting to new diet

He tries to exercise

○ Problem Scenario 3-3

But doesn’t last long

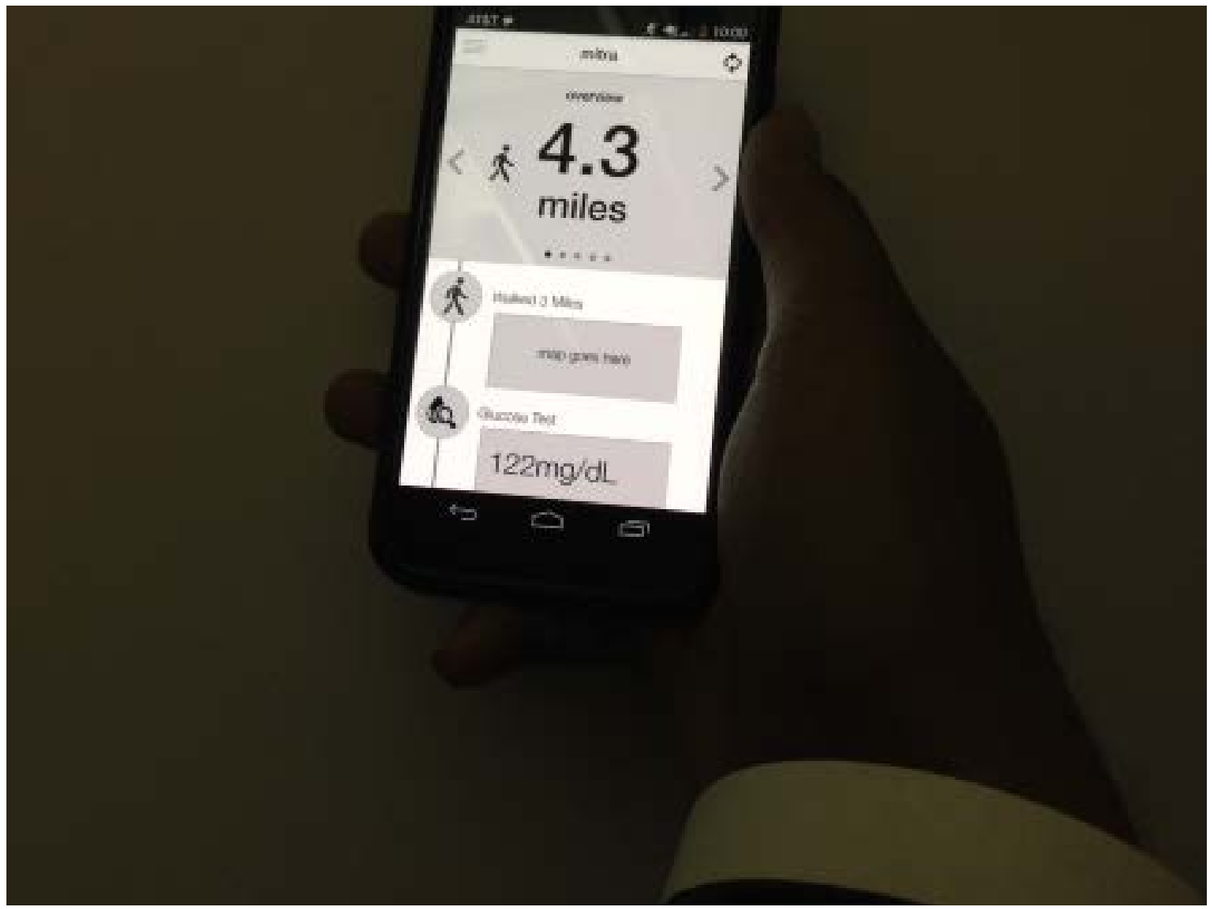
○ Solution Scenario 3-1

Hari is a type two diabetes patient that suffers from the disease for 1 year. He would like a device to monitor his behavior to control the diabetes. Today, Hari is still sleeping.

Then Hari wakes up, begins his day. He check his app to see today's plan and the blood sugar level.

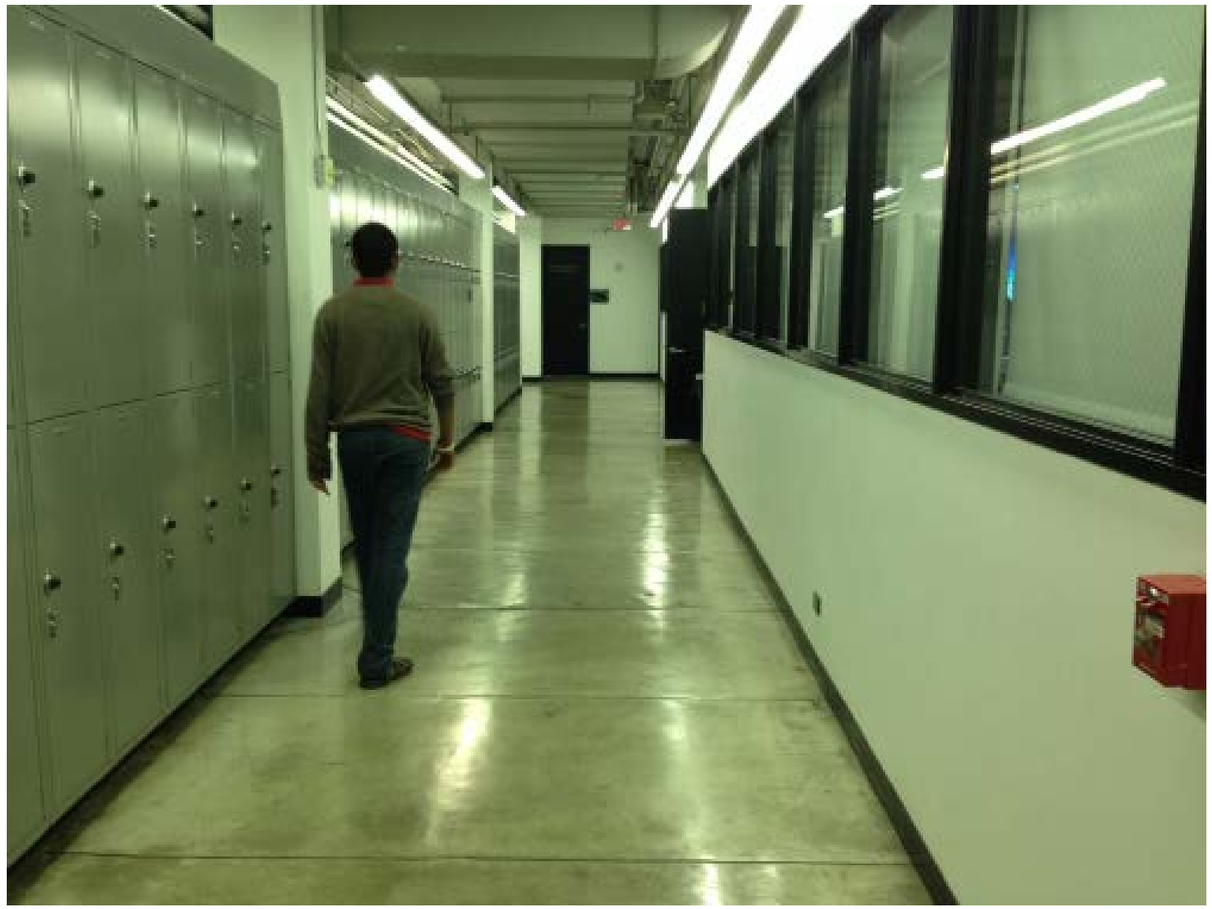
○ Solution Scenario 3-2

In the morning before breakfast, Hari's blood sugar is 112mg/dL. The bracelet will detect blood anytime so that the app can record the data. Hari is getting better.



So today's plan is walking 4.3 miles, Hari pull out the goal and start to exercise.

○ Solution Scenario 3-3



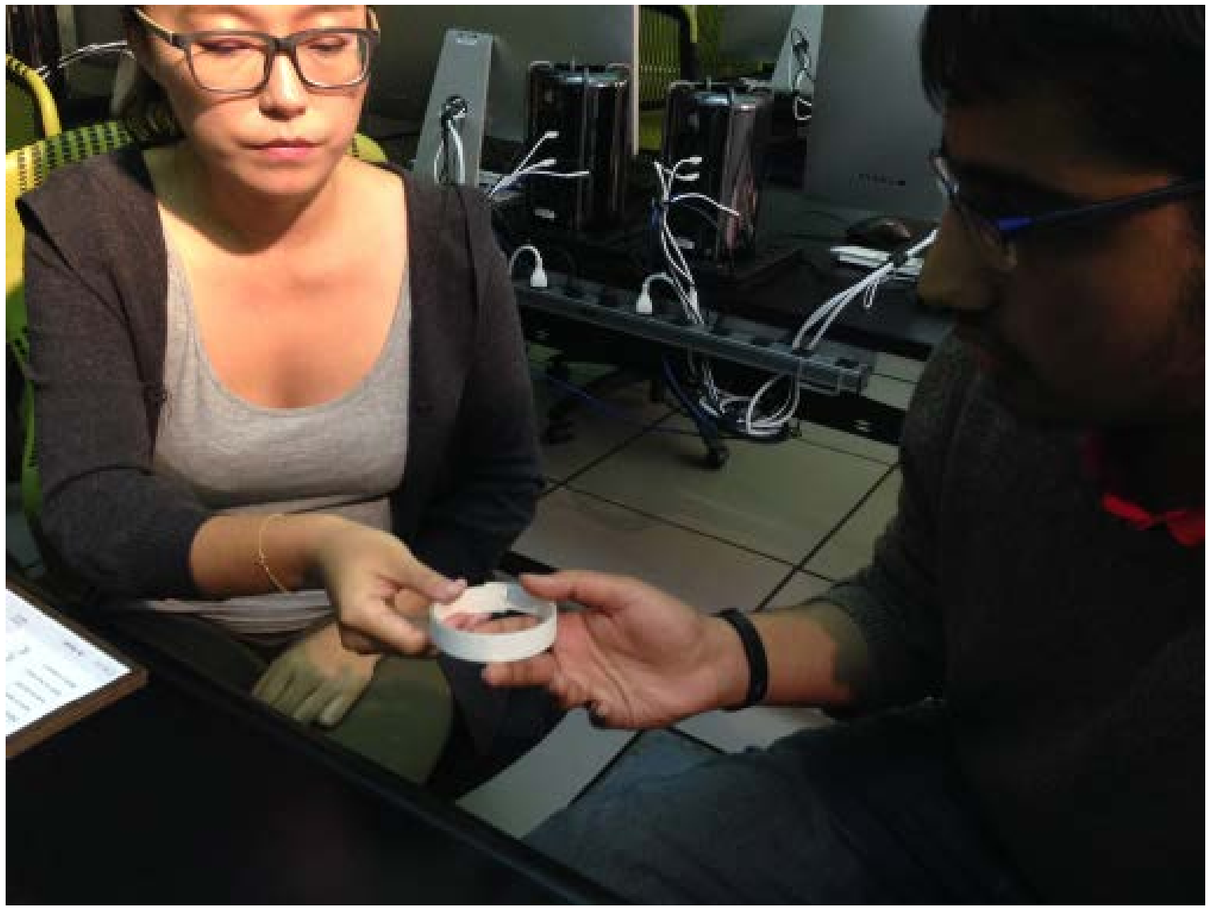
Hari begins walking wearing the bracelet.

The bracelet can record how far he walked and send to the phone, so that he can know that if he finishes today's goal.

Diabetes 101

○ Revised Scenario 4-1

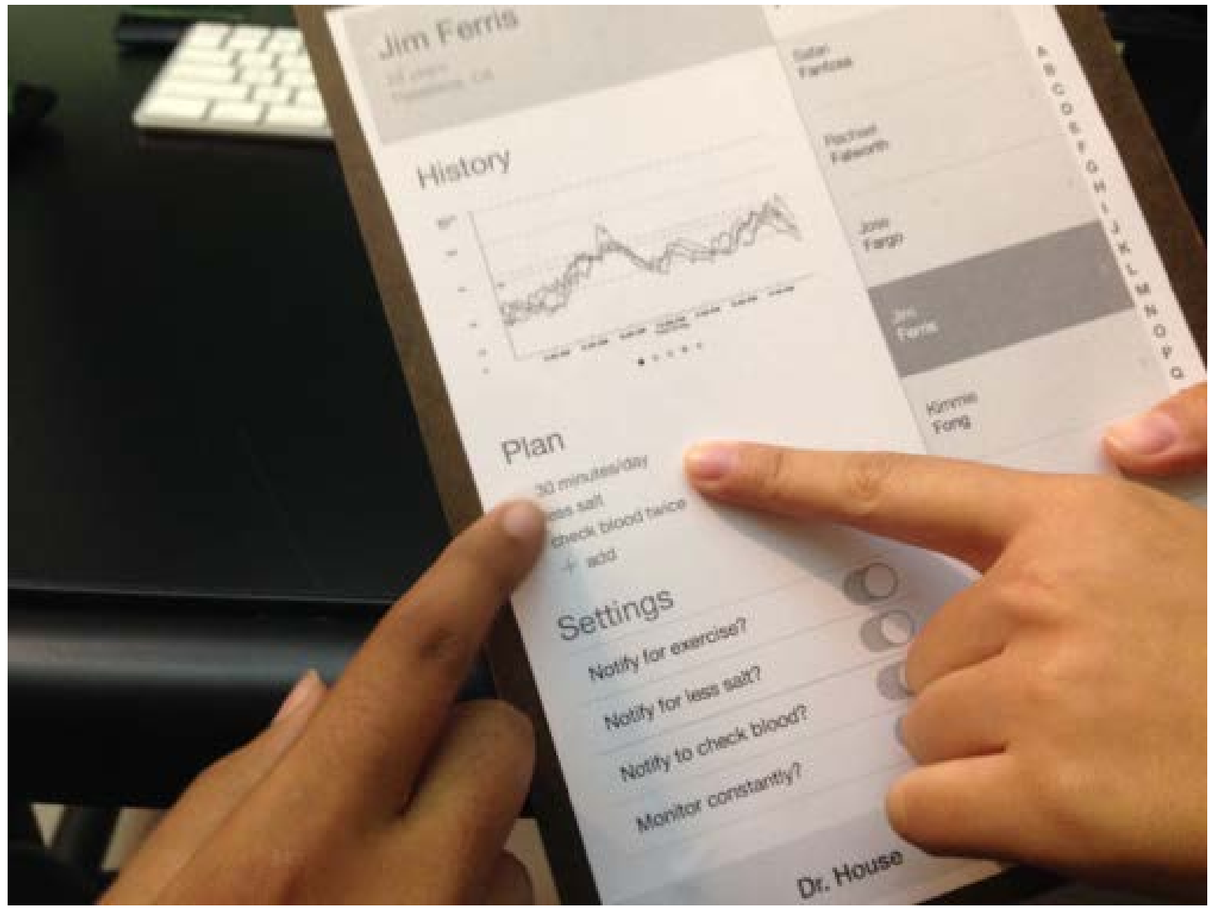
He would like doctor Wang to make a plan and moniter him that can help him control the diabetes. Today, Hari is on doctor Wang's office.



Doctor Wang give Hari the wearable bracelet so that Hari can record his behaviour everyday.

○ Revised Scenario 4-2

Hari waers the bracelet.



Then Hari and doctor Wang make the exercise plan, diet plan, pill taking plan together.

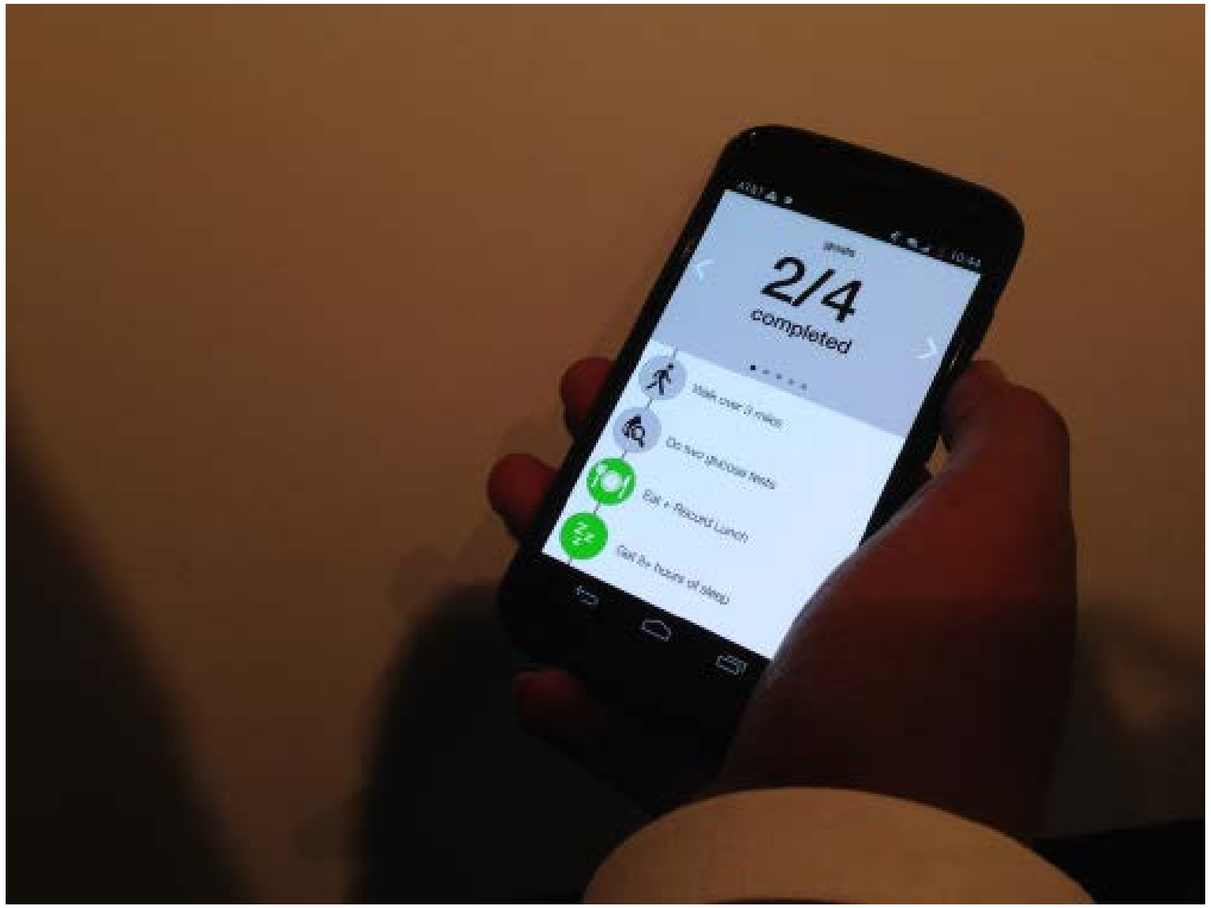
○ Revised Scenario 4-3

Doactor Wang and Hari are both very happy with the plan.

Today, Hari is still sleeping with his bracelets.

Revised Scenario 4-4

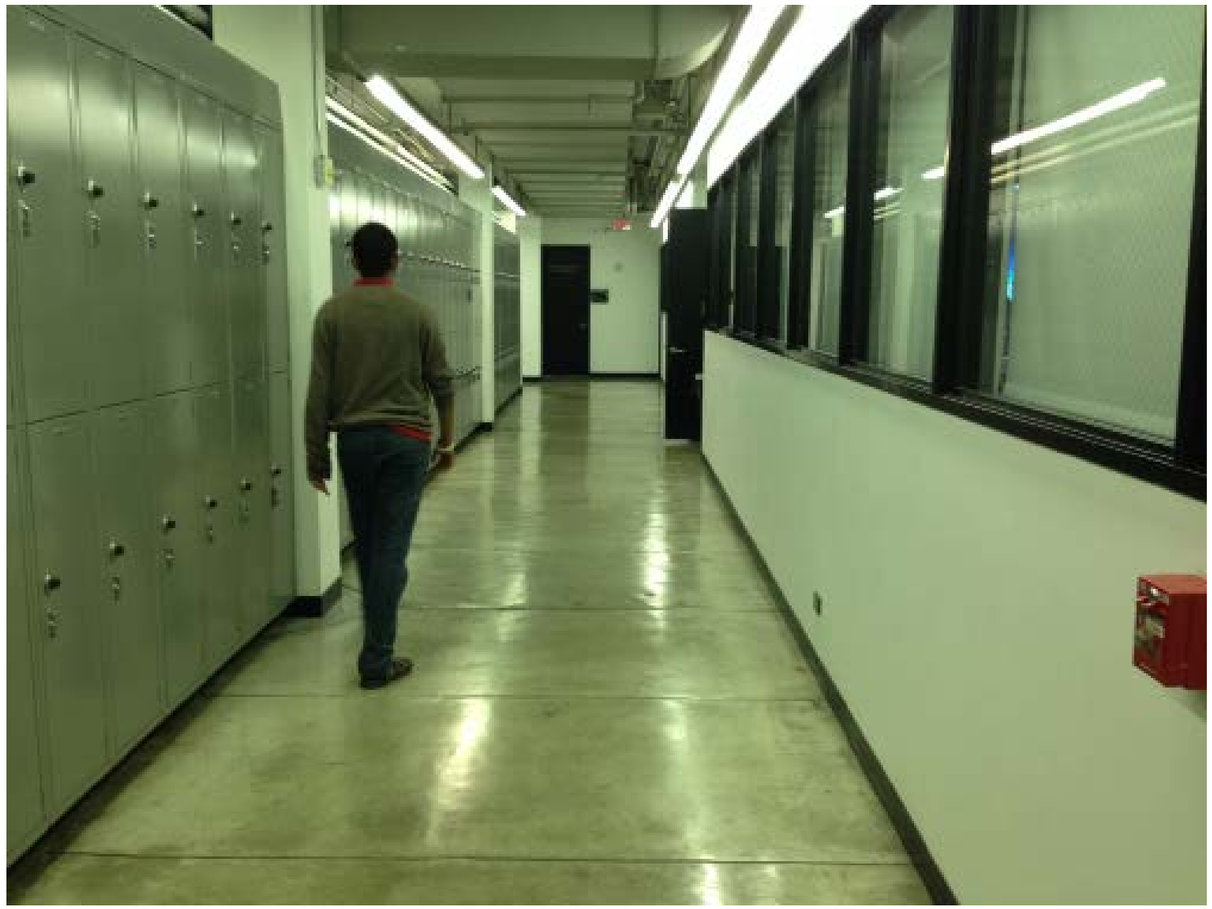
Then Hari wakes up, begins his day. He check his app to see today's plan.



The app shows he has 4 goals today and 2 more left: walk over 3 miles and take 2 glucose test.

Revised Scenario 4-5

So he begins the rst glucose test.



Then hari begin the exercise.

Revised Scenario 4-6

After his exercise, he takes the second glucose test. That's the app loading the result from the bracelet.

So hari nishes all his goals today.

Problem Scenario

○ Problem Scenario 1-1

Dr. Claudia meets with a recently diagnosed Type II Diabetes patient, Will. She goes over his test results to see what the best course of action is.

Dr. Claudia suggest some goals to get Will started. She realizes accepting diabetes is tough, so she starts off with some small goals like walking more, checking blood sugar, and eating healthy.

○ Problem Scenario 1-2

Will agrees to try, and is determined to get better. Dr. Claudia has faith in her new patient, and will goes on his way.

...It doesn't last long. Will falls into the trap and starts eating cheetos, coke, and skittles. He just isn't motivated to work on his goals.

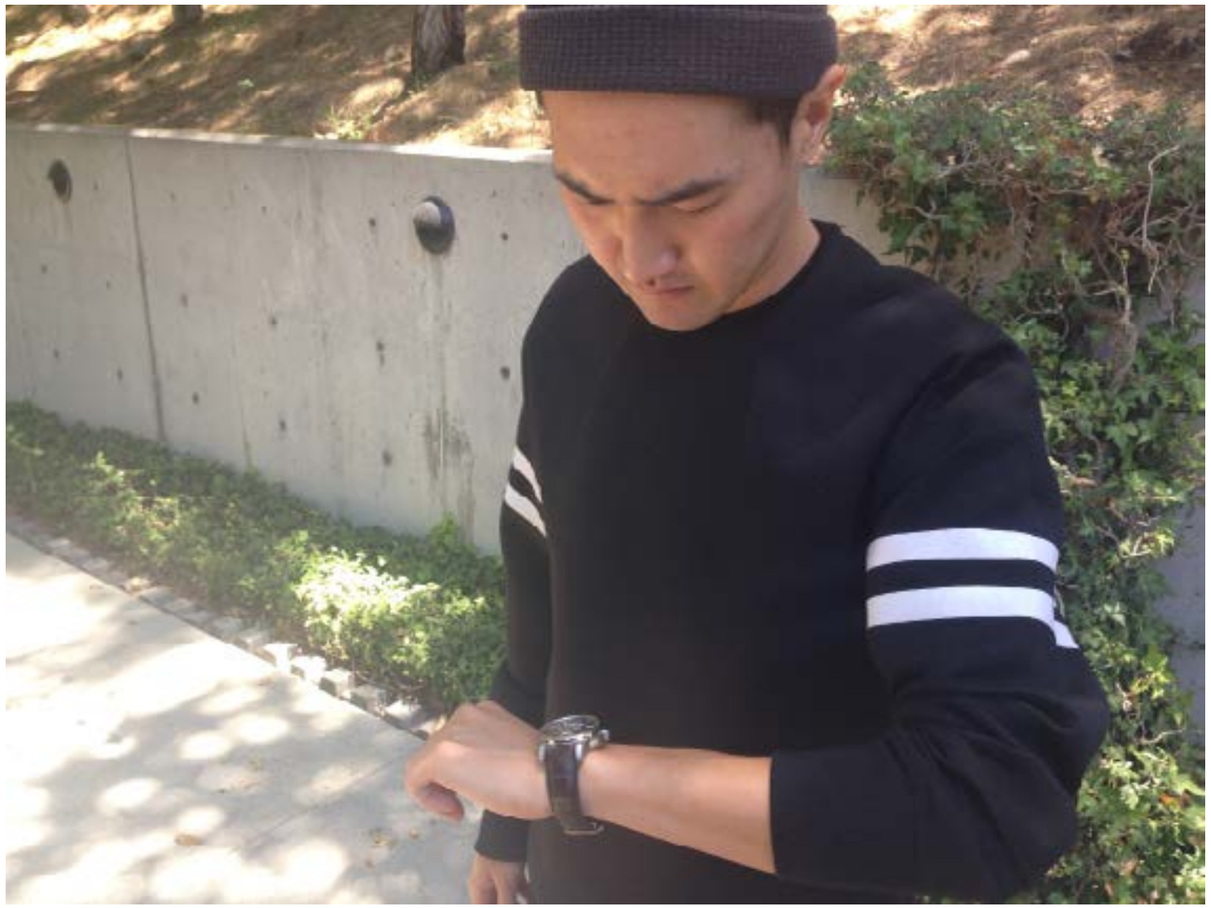
○ Problem Scenario 1-3

Will goes back for his checkup with Dr. Claudia which is underwhelming. His tests show that he has gotten much worse, and Dr. Claudia is upset and concerned.

Dr. Claudia then recommends he check out a support group to get some guidance and support through the process of changing his lifestyle.

○ Problem Scenario 1-4

Will attends a support group session which is held with two enthusiastic Type II diabetic patients, Chris and Hari. They tell will that all it takes is time, and motivation. Will is overwhelmed by all the changes.

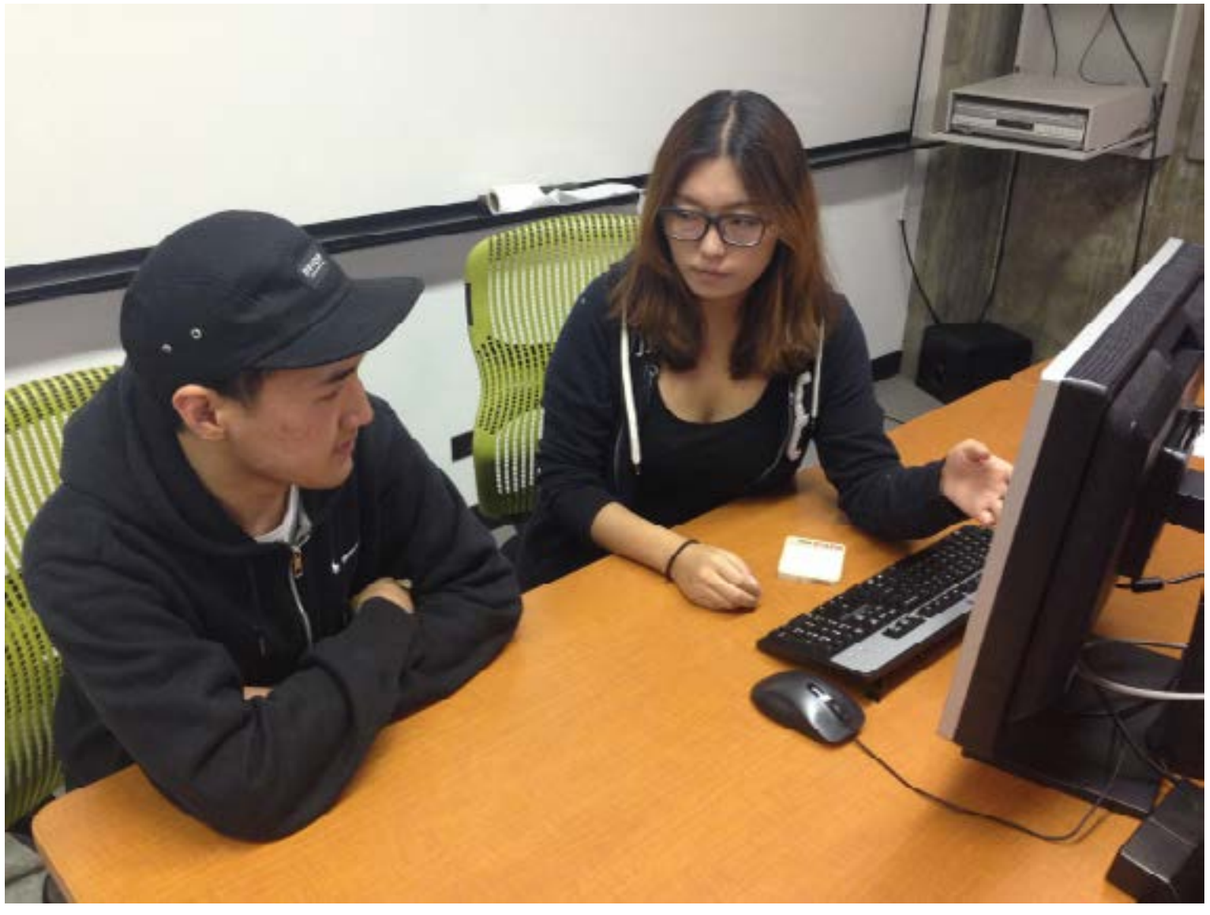


Will checks the time and realizes he has a lot of other stuff to do.

Peanut

Solution for Present

○ Solution Scenario 1-1



Dr. Claudia meets with a recently diagnosed Type II Diabetes patient, Will. She goes over his test results to see what the best course of action is.

Dr. Claudia suggest some goals to get Will started. She realizes accepting diabetes is tough, so she starts off with some small goals like walking more, checking blood sugar, and eating healthy. She also gives him a small device.

○ Solution Scenario 1-2

Will agrees to try, and is determined to get better. To help Will, Dr. Claudia gives him a small device with which he can do his blood tests. It also works with his phone so he can keep track of his stats, and other info. It also has a support system in-built.

Will does a little bit of workout, but is quickly demotivated. He doesn't feel like finishing it up.

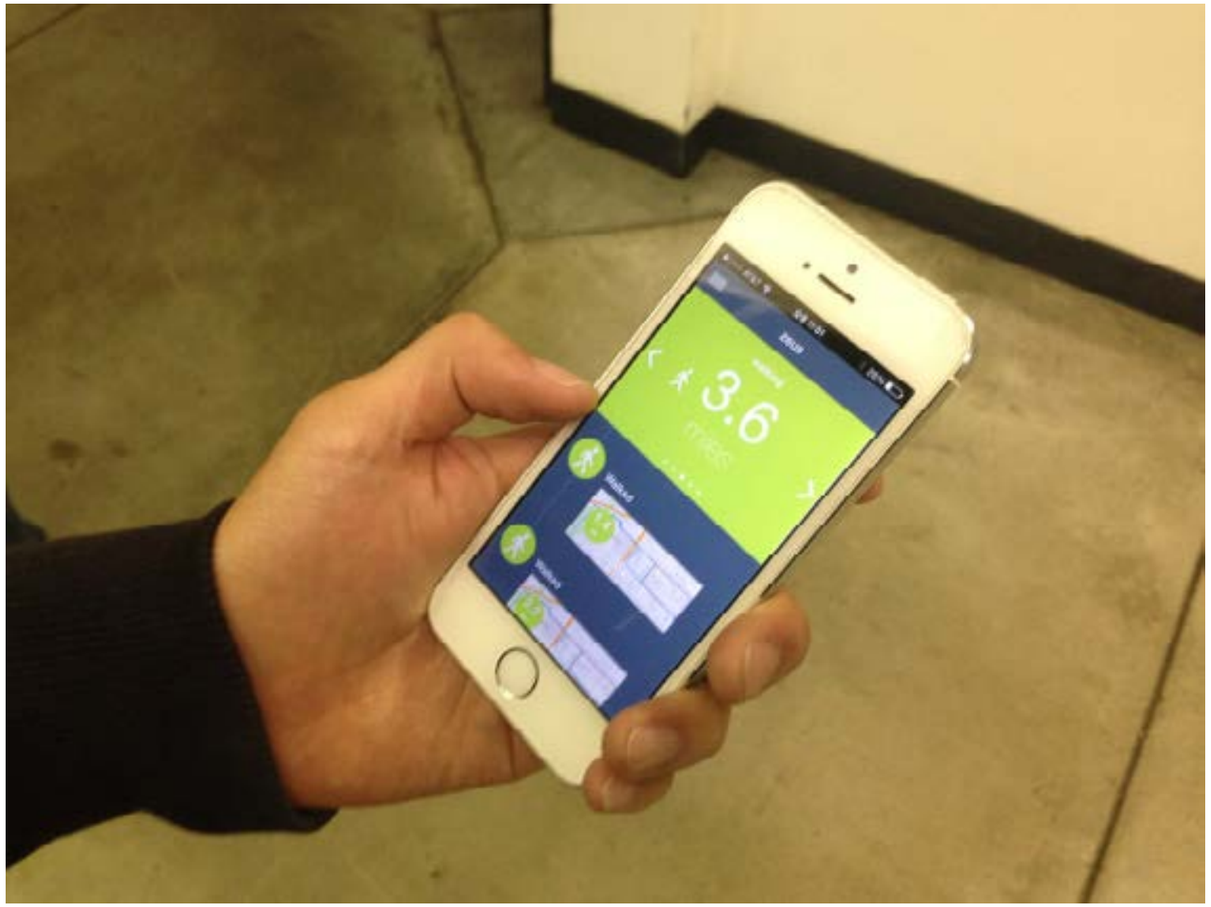
○ Solution Scenario 1-3

Will, completely demotivated, lies on a couch...not good for his health!

His support group kicks in and helps! He gets a notification on his phone telling him not to be discouraged. He's motivated by the message and knows someone cares and that there are others like him.

○ Solution Scenario 1-4

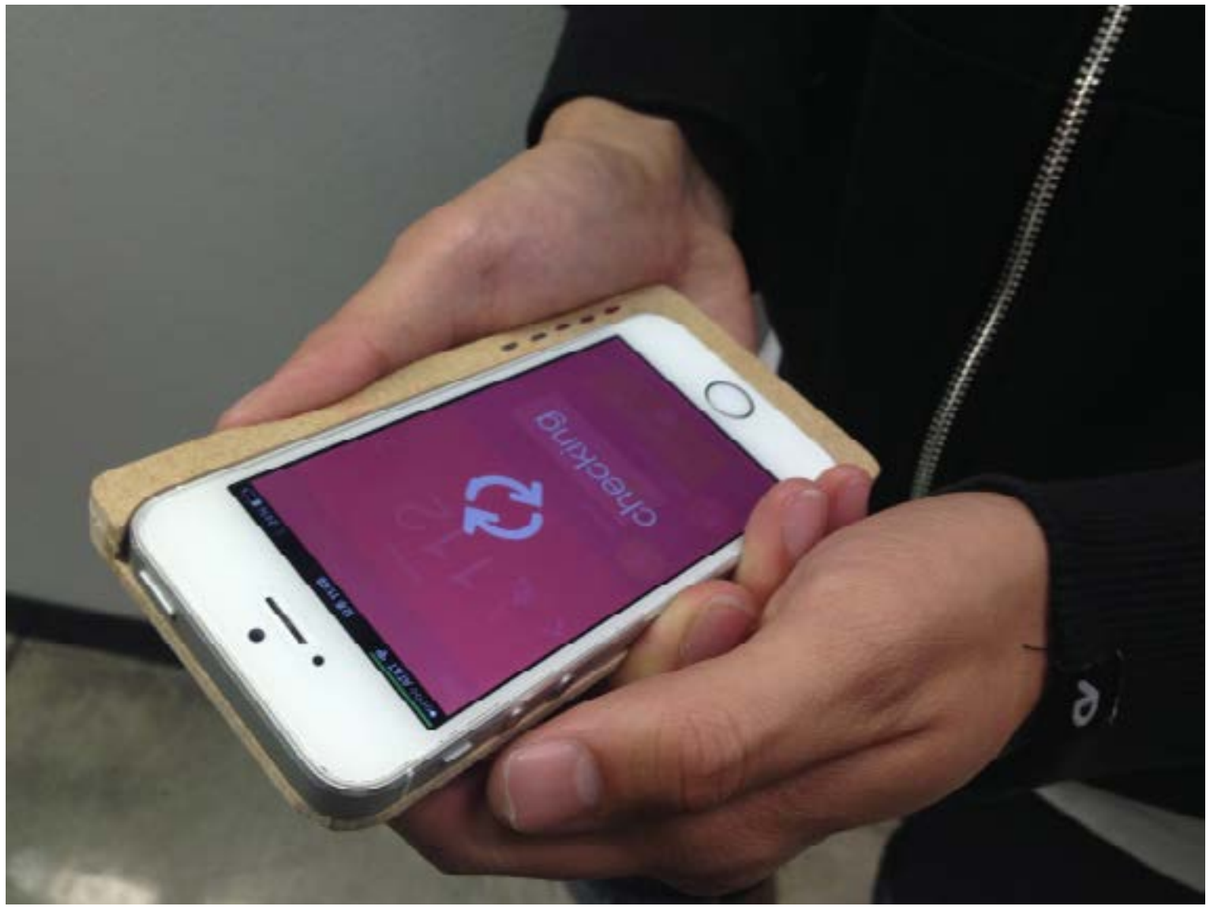
Will then finishes up his walking for the day!



He checks his phone and sees that he's hit his goal for the day!

○ Solution Scenario 1-5

Will then holds the device Dr. Claudia gave him, and clicks a button which then pricks him.



The device connects to Wills phone using bluetooth, making saving and recording the data painless.

○ Solution Scenario 1-6

Will can then see an overview of his entire day, and all the data from his blood sugar tests.

Will is on his way to becoming a healthier patient. By using a simple app and device he is able to keep track of all his stats, in addition, the support system helps keep him on track in terms of meeting his goal and living better.

Research and Findings

Persona

Name

James Chapman

Background

James Chapman is 56 years old. He retired 3 years ago. He has type two diabetes for 10 years. As a experienced patient, he want to help more patients so he holds the support group every month. Many new diabetes patients will ask him what to do.

Tools

glucometer, pills, needle, strips,
and iphone

Goal

keep his health condition while helping, guiding more new diabetes patients.

Medical Process

1. See the doctor once per 3 month.
2. Take 2 pills everyday.
3. Blood check every 2 days.
4. Hold support group every month.

Persona

Name

Jee Park

Background

Jee is 52 years old and having diabetes for 3 years. She spoke out the problems about how diabetes impact on her daily life. She also complained about the cost of supplies she buying, food habit, amount of exercise, and lifestyle changed since she had diabetes.

Tools

Relion Blood test monitor, Insulin, Pills, Needle, and test strip.

Goal

More spend time on exercise, Keep blood sugar leve in safety level,

Medical Process

1. See the doctor every 3 months.
2. Buy tools/supplies every 3 months/cost $300 dollars.
3. Take 4 pills a day
4. Blood check everyday and insulin once a month.

Technology Research

Infrared Spectroscopy

Overview

Infrared spectroscopy is a well established and documented method of monitoring blood glucose levels. Medical publications document its use with blood, saliva and urine. By reducing the size, cost and weight of infrared spectrometers, Pyreos has enabled their use as personal medical diagnostic products including their use as non–invasive diabetes monitoring devices.

Company

Pyreos

Key Benefits

Accurate and painless, non-invasive diagnostics
Enables new, continuous modelling of individual health monitoring
Affordable & long lasting device

Development

4~5 years out

Doctors and Patients

Our target space is the physicians and diabetic patients who encounter problems complying with the doctor's direction. The system and products are designed to provide ease for the patients and the doctors to keep up and track the treatment process, and satisfy both the doctor and the patients.

Non Compliance and Support

Physicians with different professions and specialities, often conflict on their prescription or method of treatment when dealing with diabetic patients. This is a particularly bad scenario as diabetic patients are know to have serious complications. While doctors know this is an issue, what they don't have is a direct mode of communication and collaboration to help solve this problem, that could in severe cases lead to death. We hope to provide an end to end solution that will connect doctors, patients, hospitals, clinics, and pharmacies together, as to help. avoid discrepancies and communication gaps and errors by increasing the collaboration between these various parties.

State of the Situation

Number of Patients

29.1 million people with diabetes in U.S.

1.7 million new patients in 2012

1.9 million new patients in 2010

Social Cost

$245 billion: Total costs of diagnosed diabetes in the United States in 2012

$176 billion for direct medical costs

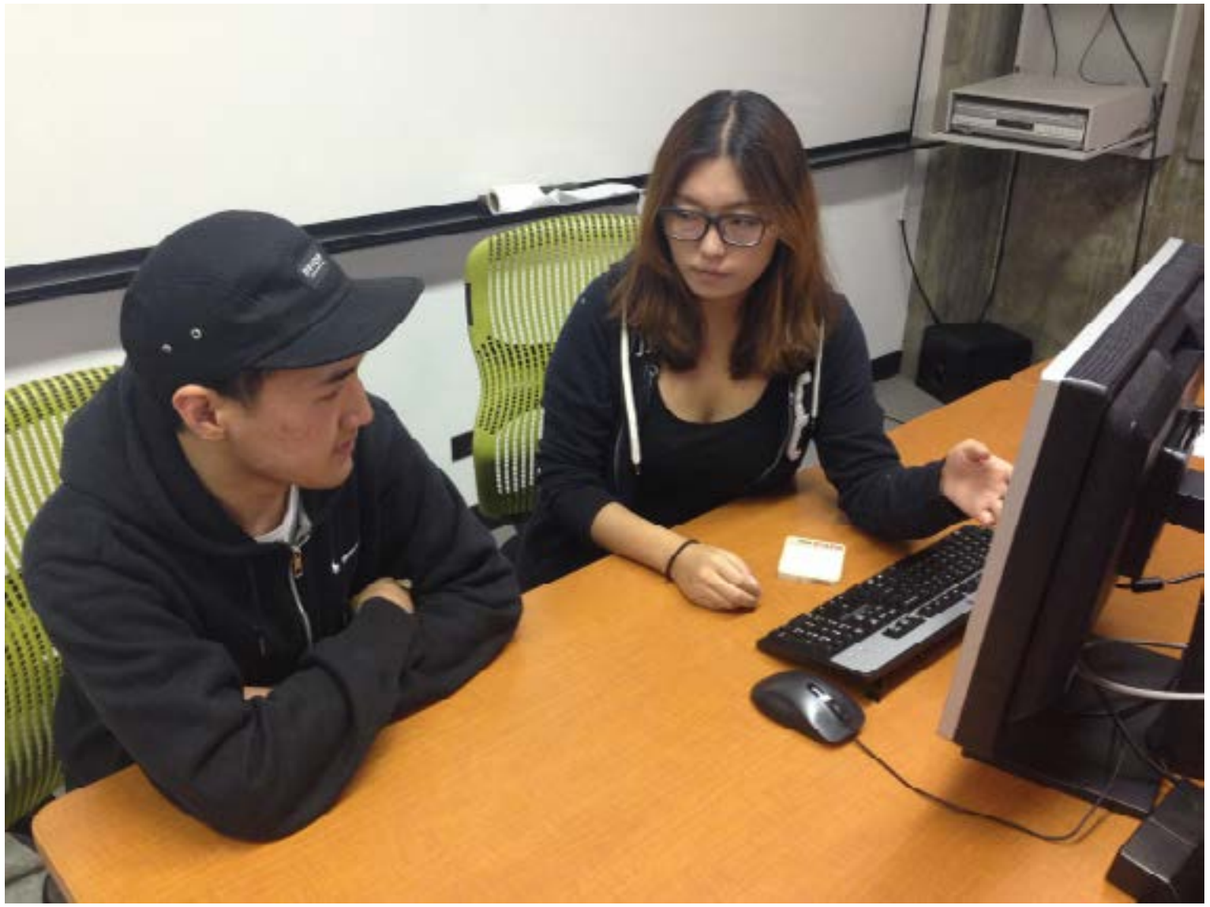
$69 billion in reduced productivity

Chris Yoon, Claudia Wang, Hari Ramachandran, Will Lee

Glucase

Solution for Future

○ Solution Scenario 2-1



Dr. Claudia meets with a recently diagnosed Type II Diabetes patient, Will. She goes over his test results to see what the best course of action is.

Dr. Claudia suggest some goals to get Will started. She realizes accepting diabetes is tough, so she starts off with some small goals like walking more, checking blood sugar, and eating healthy. She also recommends a case that connects to his phone for constant monitoring

○ Solution Scenario 2-2

Will agrees to try, and is determined to get better. To help Will, Dr. Claudia gives him a small device with which he can do his blood tests. It also works with his phone so he can keep track of his stats, and other info. It also has a support system in-built.

Will does a little bit of workout, but is quickly demotivated. He doesn't feel like finishing it up.

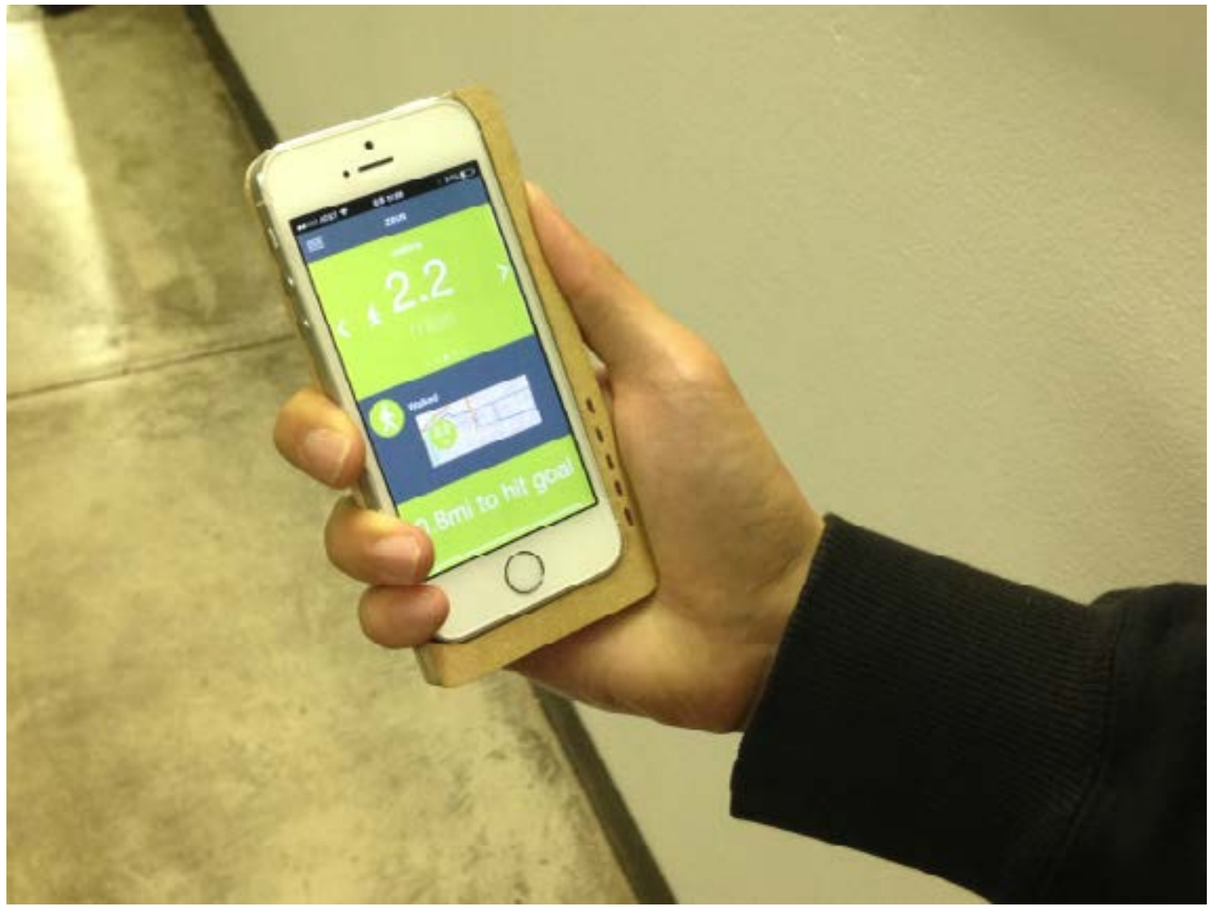
○ Solution Scenario 2-3

Will, completely demotivated, lies on a couch…not good for his health!

His support group kicks in and helps! He gets a notification on his phone telling him not to be discouraged. He's motivated by the message and knows someone cares and that there are others like him.

○ Solution Scenario 2-4

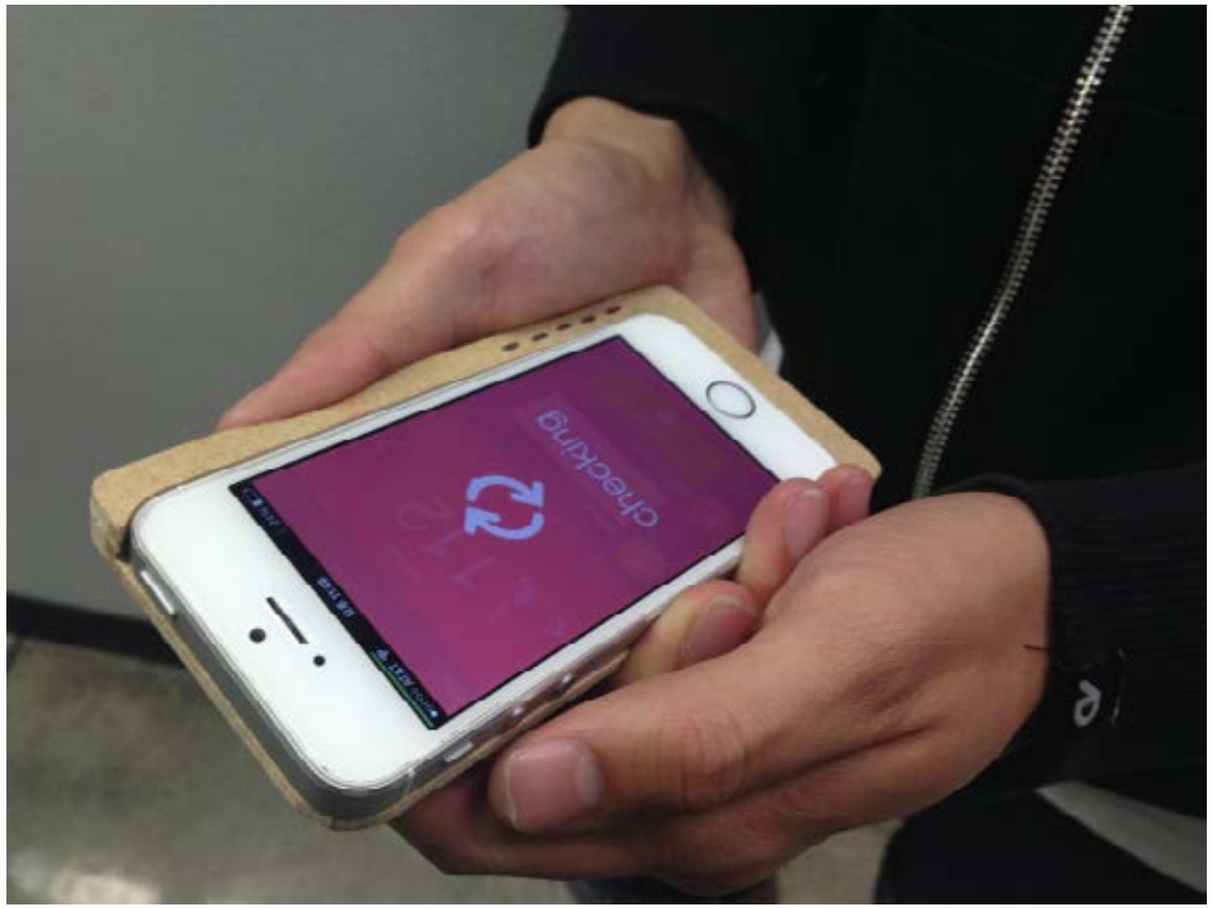
Will then finishes up his walking for the day!



He checks his phone and sees that he's hit his goal for the day!

○ Solution Scenario 2-5

In this shot, you can see where Wills finger is. We can get an accurate reading on his blood sugar without a prick of any sort! We literally solved a pain-point.



The device connects to Wills phone using the data transfer port, making saving and recording the data painless.

○ Solution Scenario 2-6

Will can then see an overview of his entire day, and all the data from his blood sugar tests.

Will is on his way to becoming a healthier patient. By using a simple app and device he is able to keep track of all his stats, in addition, the support system helps keep him on track in terms of meeting his goal and living better.

Case Study Research

Danielle Ofri, M.D.

"As soon as a patient is described as noncompliant, it's as though a black mark is branded on the chart. This one's trouble, flashes into most doctors' minds, even ones who don't want to think that way about their patients. And like the child in school who is tagged early on as a troublemaker, the label can stick around forever."

"Improving adherence is a team sport. Input from nurses, care managers, social workers and pharmacists is critical."

"My grandmother died suddenly in her home, at age 87, most likely of a massive heart attack. It was a painful loss for all of us. Had she taken her medicines at the appropriate doses, she might have survived the heart attack"

Design Tenets

1. Easy to manage scheduled tests and activities

2. Able to conduct tests without drawing attention

3. Fast and easy to communicate data, alerts, and prescription

4. Minimize doctor's intake of alerts

5. Give patients psychological comfort

Interview

Robin Berzin M.D.

“When somebody comes into my office I get this one minute look at what their life is like. I get their vital signs. I get a certain gestalt what their what’s going on with them whether they’re doing well whether they’re doing poorly but I don’t know what the other 99 percent of their life looks like.”

Interview

Name

Byung-woo Yoon M.D PhD.

Difficulties In Facing Pateints

“Face to face time with the patient is limited, therfore the information we can obtain regarding the detail of the patient’s habit and lifestyle can be either inaccurate or limited as well.”

“Patients often face difficulties in keeping their direction in terms of diet and medication schedule, which makes it difficult for the doctors to proceed with further procedure.”

Findings

Patient's noncompliance causes issues for the doctor to proceed with further treatment.

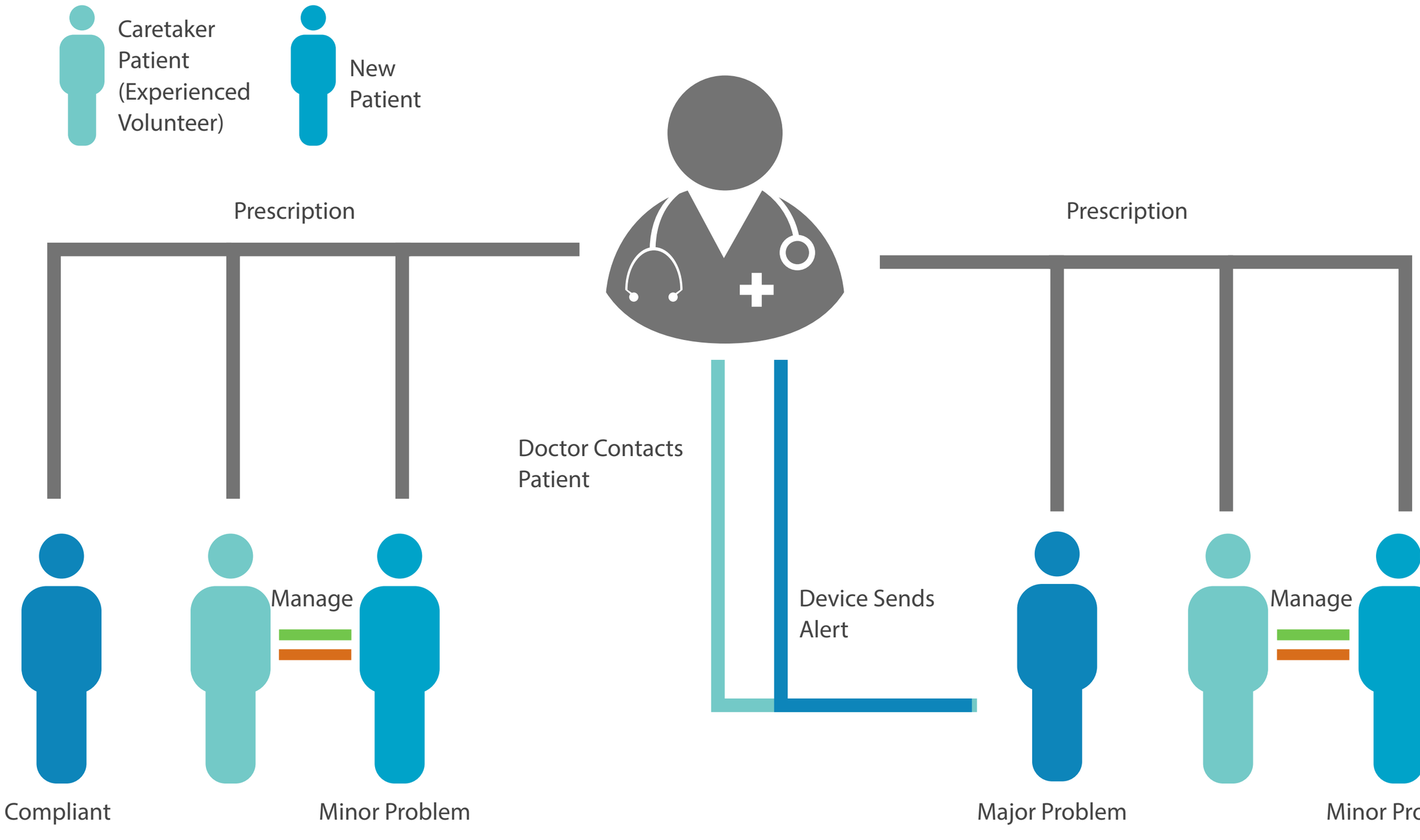
Some patients don't do what the doctor tells them, they often forget what the doctor tells them.

Short face to face time with the patient does not give enough information about the patient.

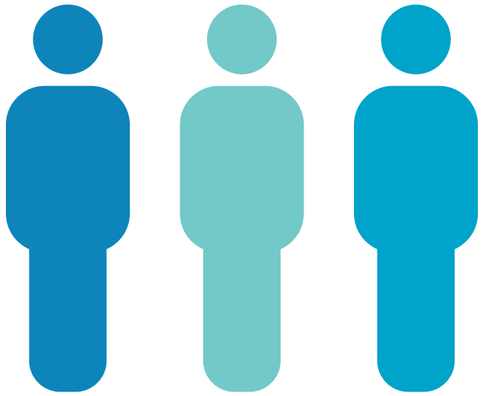
Doctors deal with massive amount of data which can take a lot of time to interpret

Collaboration between the doctor and the patient in terms of making a plan to get healthy is becoming more important in general healthcare. For diabetes however, doctors said that they need to create a personalized plan on how to manage the patients diabetes.

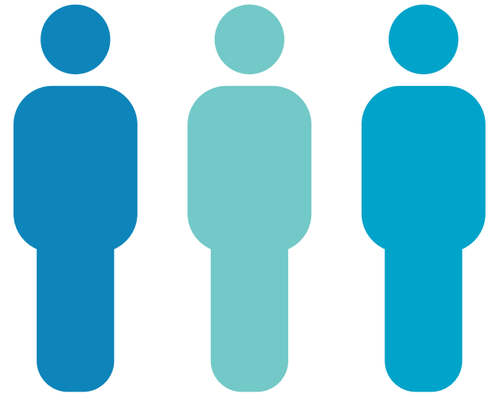
The System


Caretaker Patient (Experienced Volunteer)
New Patient
Prescription
Prescription
Doctor Contacts Patient
Device Sends Alert
Manage
Manage
Compliant
Minor Problem
Major Problem
Minor Problem

The System

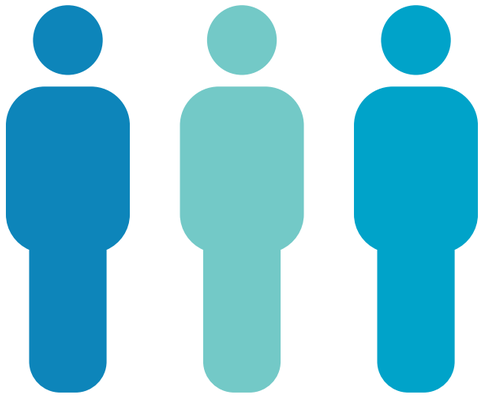


Patient Group 1

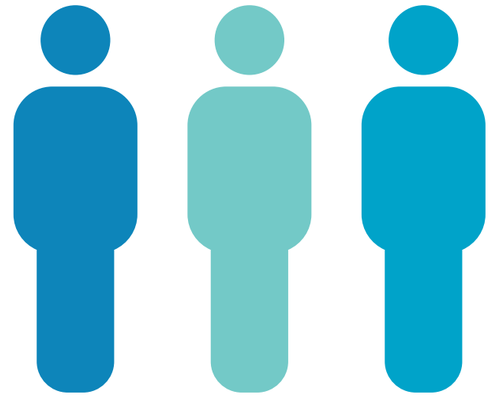


Patient Group 2

Doctor Assigns New
Patient in a Group

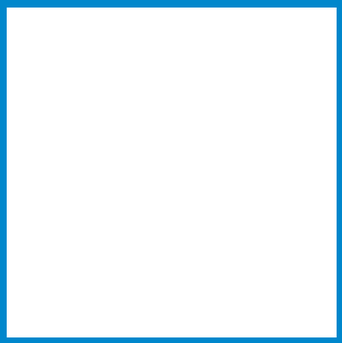


Patient Group 4



Patient Group 3

Diagram



Dell Data Management

Access

Nutritionist

Diet

Diet Data

Medical Data

Nurse

Patient who has diabetes,or who was recently been diagnosed with diabetes

Education

What is it?

How to use tools

Change of lifestyle

Prescriptio

Medicine

Check-up sc

Exercise

Access

Doctor

on Direction

hedule

What Patient Goes Through

Just been diagnosed as Type 2 Diabetes

- Non-compliance
- Confusion
- Difficulties in transitioning
- Denial
- Anger
- Depression
- Guilt
- Stress

Suggested Solution

Lifestyle coach

- Gather/Manage data
- Giving Advice
- Helping the patients to comply
- fitting into the new lifestyle

Family

Friends

Support Group

Emotional Support

Ex) Making the patient to feel loved

Letting Patient know that nothing has chan

Not making a big deal out of it

Lifestyle coach

Data

-Medicine compliance
-Blood pressure
-Glucose level
-Daily exercise
-Daily die

Data Processed

-Feedback on progress
-Lifestyle improvement
-Recommendations

Patient

Successful Transition

Outcome

Data Accumulation

Professionals

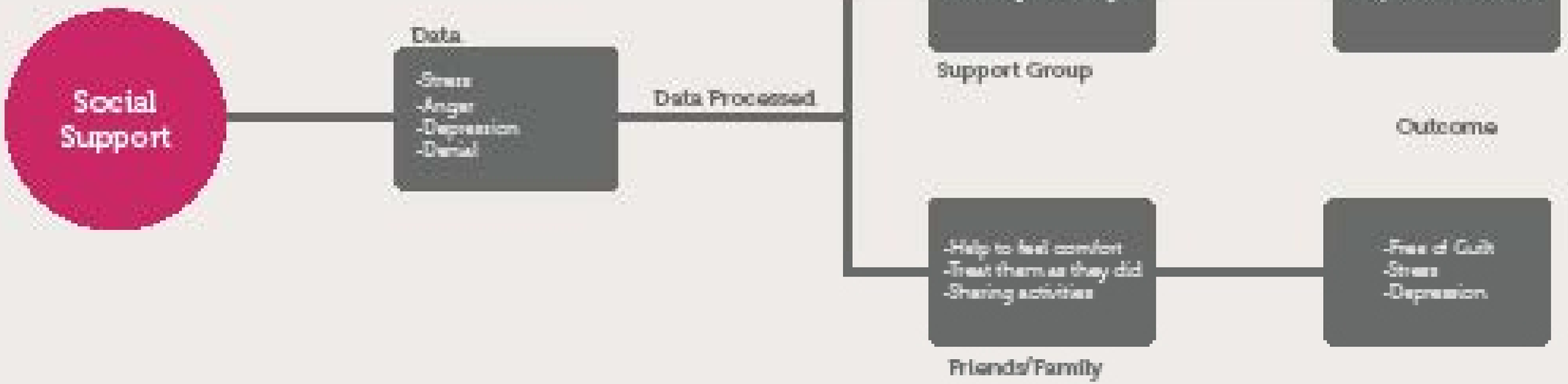
-Better assessment
-Base on richer data

Group

ged

Social Support

- Giving full support to patient
- Nothing has changed
- Help them ease through change
- Sharing Experience



Competitors

Competitor

Sony Promises Emotion Detecting Touchscreen Table

The table comprises a video-based movement-tracking system, a computer, a beamer and a screen, explains Atracsys on its web site. It will also have two Sony ISS XCD-V60 cameras to build a 3D image, according to gadget news blog Pocket Lint. What's intriguing is Sony's comment that the Atracsys table can also detect emotion such as surprise, happiness and anger.

The tracking system detects the positions and movements of a user's fingers and the objects on the screen. The data is processed by the computer and sent back to the beamer resulting in what seems like real-time interaction with the device. The whole set-up fits inside the table so users don't see anything beyond the touchscreen display, as the video below shows.

Competitor

Stanford engineers design video game controller that can sense players' emotions

The prototype controller has had its back panel replaced with a 3D printed plastic version stuffed with sensors. There are metal pads like those you find on gym equipment which measure heart rate, blood flow, rate of breathing and deepness of breath. There's also a light-operated sensor which picks up a second pulse measurement plus accelerometers to track how frantically a player of moving the controller.

So far it's only been used to generate an understanding of how a player responds physiologically and emotionally to a game but the intention is to find ways to use the player data to alter the game experience. For example, if a player becomes bored the game would use the sensors to detect this and perhaps alter the difficulty or pacing accordingly.

"If a player wants maximum engagement and excitement, we can measure when they are getting bored and, for example, introduce more zombies into the level," said McCall of his own project. "We can also control the game for children. If parents are concerned that their children are getting too wrapped up in the game, we can tone it down or remind them that it's time for a healthy break."

Competitor

Emospark is a cube-shaped "artificial intelligence console" that uses face-tracking and language analysis to assess human emotion and deliver relevant content accordingly.
Created by inventor Patrick Rosenthal, the Emospark console measures 90 x 90 x 90 and is designed to sit in the home and interact with people. At its core lies a chip called the "Emotional Processing Unit" that allows the system to build up an Emotional Profile Graph of the people in the house. To communicate with the Android-powered Emospark, users can simply talk to it through speaking or typing into their tablet, mobile phone (which means it can gauge your emotions on the move), computer or TV. It combines this with face-tracking technology to gauge the user's likes and dislikes by categorising their emotional responses to music, videos and other content (using an emotional spectrum based on seven emotions: joy, sadness, trust, disgust, fear, anger, surprise and anticipation). Users can also connect with Facebook and YouTube to help the cube build up a history of interests. Emospark initially tries to recommend particular pieces of content -- be it a song or a YouTube video -- that might help to improve the user's mood. So, for example, the cube might tell you that your friend Michael has posted a new video onto Facebook and it has 12 likes, would you like to watch it. If you say yes, the cube will play it on the TV or other device. If you start to laugh, it will show you similar content. Rostenthal told Wired.co.uk that Emospark is designed to achieve "a positive singularity". He explained that there are two versions of the future: one which goes in the way of the Terminator, with robots based on pure logic and another full of emotions, "like Wall-E, a cute robot full of emotions who saves humans from logical robots".

Competitor

Darpa to Troubled Soldiers: Meet Your New Simulated Therapistt

For now, the system, called SIM Sensei, is being designed for use at military medical clinics. A soldier could walk into the clinic, enter a private kiosk, and log on to a computer where his or her personal simulated therapist — yes, you can pick from an array of different animated docs — would be waiting. Using Kinect-like hardware for motion sensing, a microphone and a webcam, the computer's software would take note of how a patient moved and how they spoke.

Competitor

The d°light Huggable light-emitting pillow

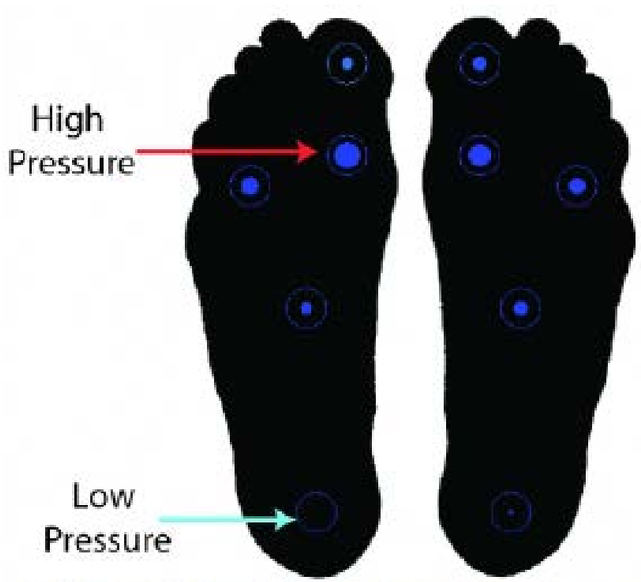
Competitor

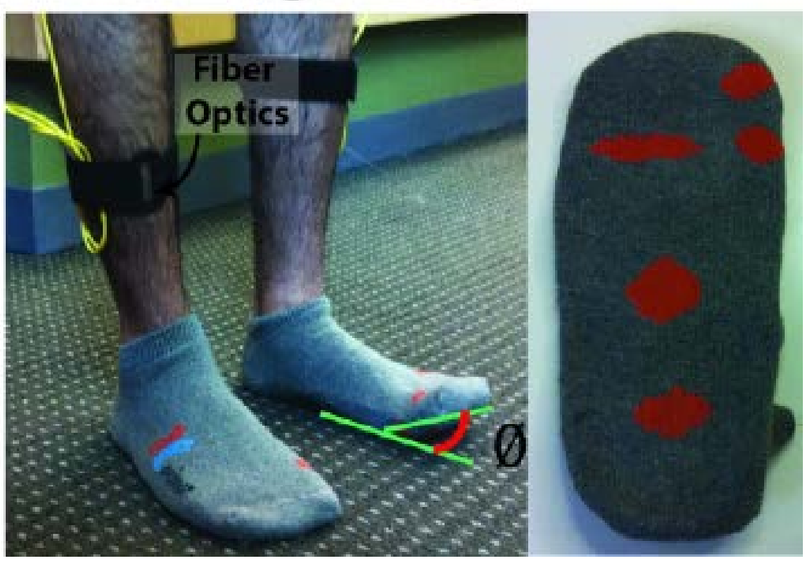
Meet Pepper, the £1,000 robot that will read your emotions

Like the Tin Man in The Wizard Of Oz, the robot community has finally found its heart. This time around it's not made of sawdust-stuffed silk. Better -- sensors, cameras, microphones and proprietary algorithms that calculate human emotion according to vocal intonation and facial expressions. And soon it could be ambling around your home, asking if you feel alright, after it goes on sale in Japan from February 2015 for 198,000 yen (£1,151.99).

Pepper is a Wi-Fi enabled humanoid robot that weighs 28kg, features a 10.1-inch touchscreen and can move at speeds of up to 3km/h. It'll also only stay alert for 12 hours, before its Lithium-ion battery gives out. Pepper is the result of a collaboration between Japan's SoftBank Mobile and Aldebaran Robotics, which specialises in the kind of touchy-feely humanoids not feted to bring down Earth in Hollywood movies. In a release, the companies branded it: "the world's first personal robot that can read emotions."

Competitor



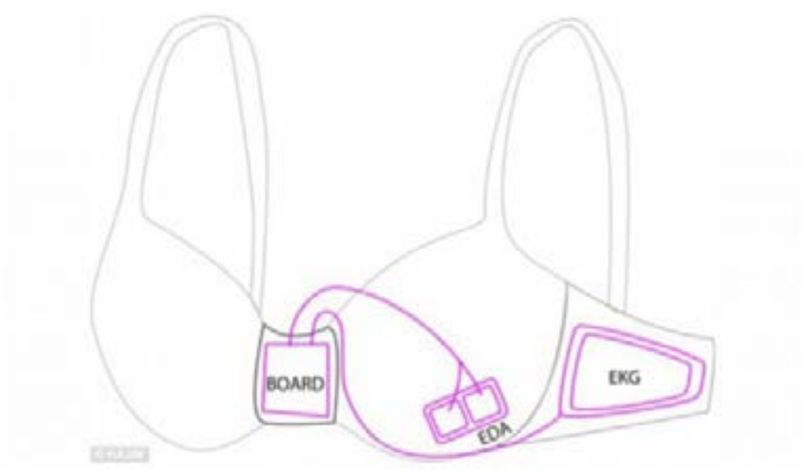


Smart Sox

The University of Arizona Department of Surgery's Southern Arizona Limb Salvage Alliance, or SALSA, the Interdisciplinary Consortium on Advanced Motion Performance.

The socks are made from cutting- edge, intelligent textiles that use fiber optics and sensors to monitor temperature, pressure and joint angles in the feet, alerting medical professionals and wearers of the socks of any developing problems. People with diabetes often lose the sensation of pain and are unaware of developing foot ulcers.

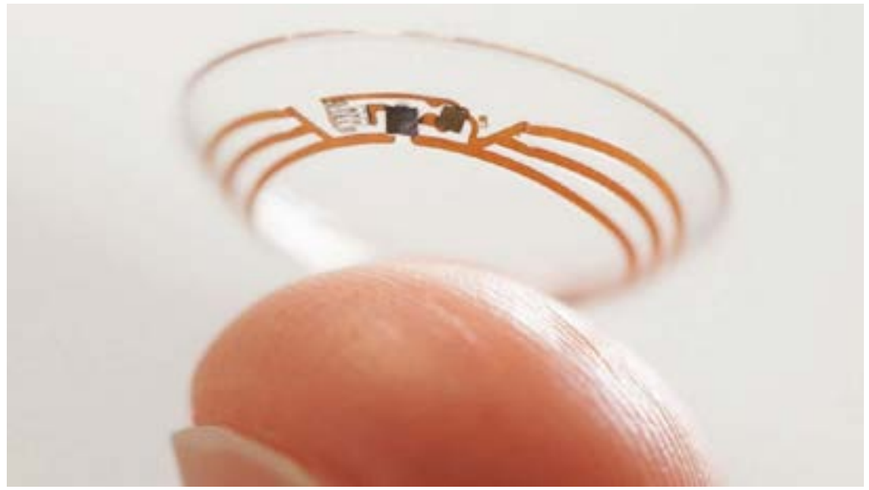
Competitor



Microsoft Smart Bra

Researchers at Microsoft have developed a prototype of a “smart bra” embedded with physiological sensors that seek to monitor a woman’s heart activity to track her emotional moods and combat overeating. The sensors can signal the wearer’s smartphone, which then flash a warning message to help her step away from the fridge and make better diet decisions.

Competitor



Google Smart Contact Lens

Over the years, many scientists have investigated various body fluids— such as tears—in the hopes of finding an easier way for people to track their glucose levels. But as you can imagine, tears are hard to collect and study. At Google[x], we wondered if miniaturized electronics —think: chips and sensors so small they look like bits of glitter, and an antenna thinner than a human hair— might be a way to crack the mystery of tear glucose and measure it with greater accuracy.

Competitor

Philp Design Emotional Sensor

Most electronic communication is limited to very direct channels where we naturally exhibit many more signals or channel indirectly. This opens up a whole new universe of emotional applications, such as physical and emotional gaming, mind and stress control applications, as well as emotional telephony.

Competitor

The UP System

UP helps you understand you sleep, move, and eat so you can make smarter choices. The new app displays movement and sleep details from your UP24 or UP band and delivers insights, celebrates milstones, and chellegnes you to make each day better. Share accomplishments with friends by teaming up in the UP app.

Competitor

The Tinkle

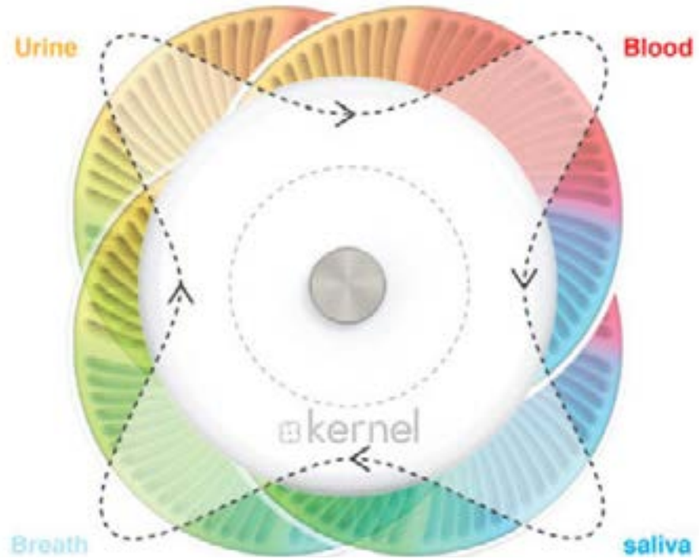
The Tinke device plugs into the charging port of an iPhone and tracks heart rate, respiratory rate, blood oxygen levels, as well as heart rate variability. A user holds their finger on the Tinke sensor for 30 seconds, which then detects changes in skin blood volume and gives them a wellbeing score.

What does it do? The Tinke device plugs into the charging port of an iPhone and tracks heart rate, respiratory rate, blood oxygen levels, as well as heart rate variability.

Competitor

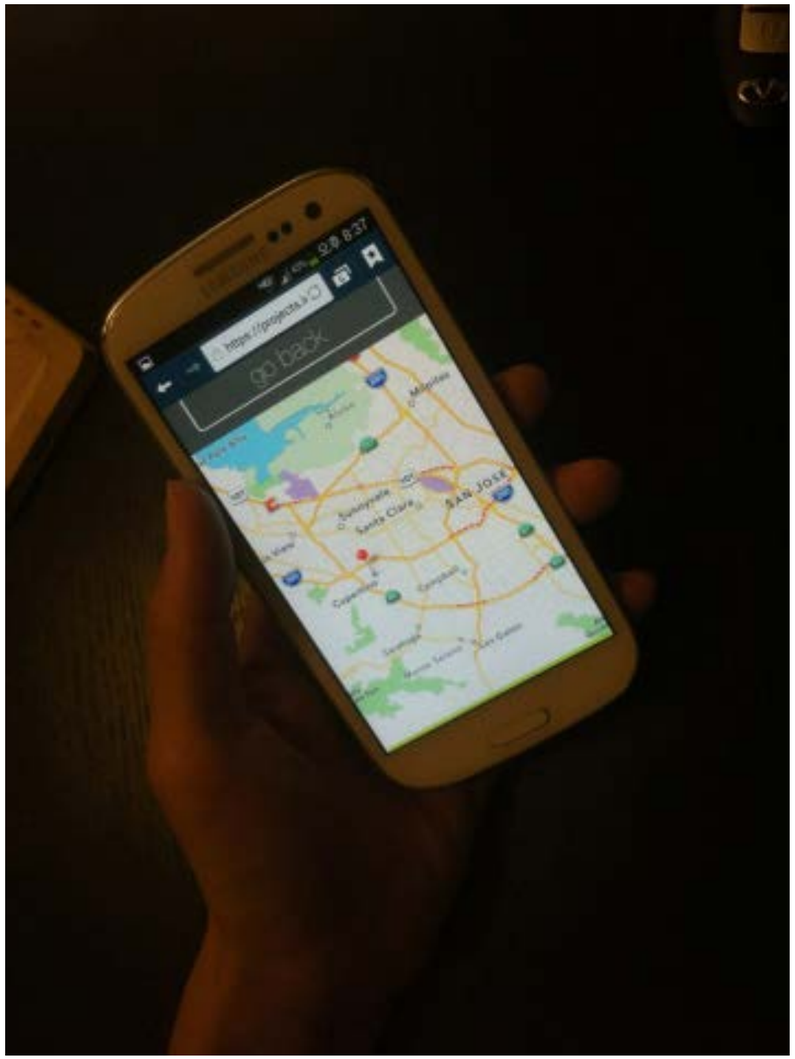
Kernel of Life

Kernel of Life is designed to leverage the power of smartphones and the cloud to let those in rural areas test themselves for diseases. Created by the San Francisco-based Fuseproject, Kernel of Life is designed to test for disease in four different ways: breath, saliva, blood and urine. The device sends the results to your phone via Bluetooth. Your results can be sent to a remote doctor who can provide treatment advice, in addition to a diagnosis.



Interview

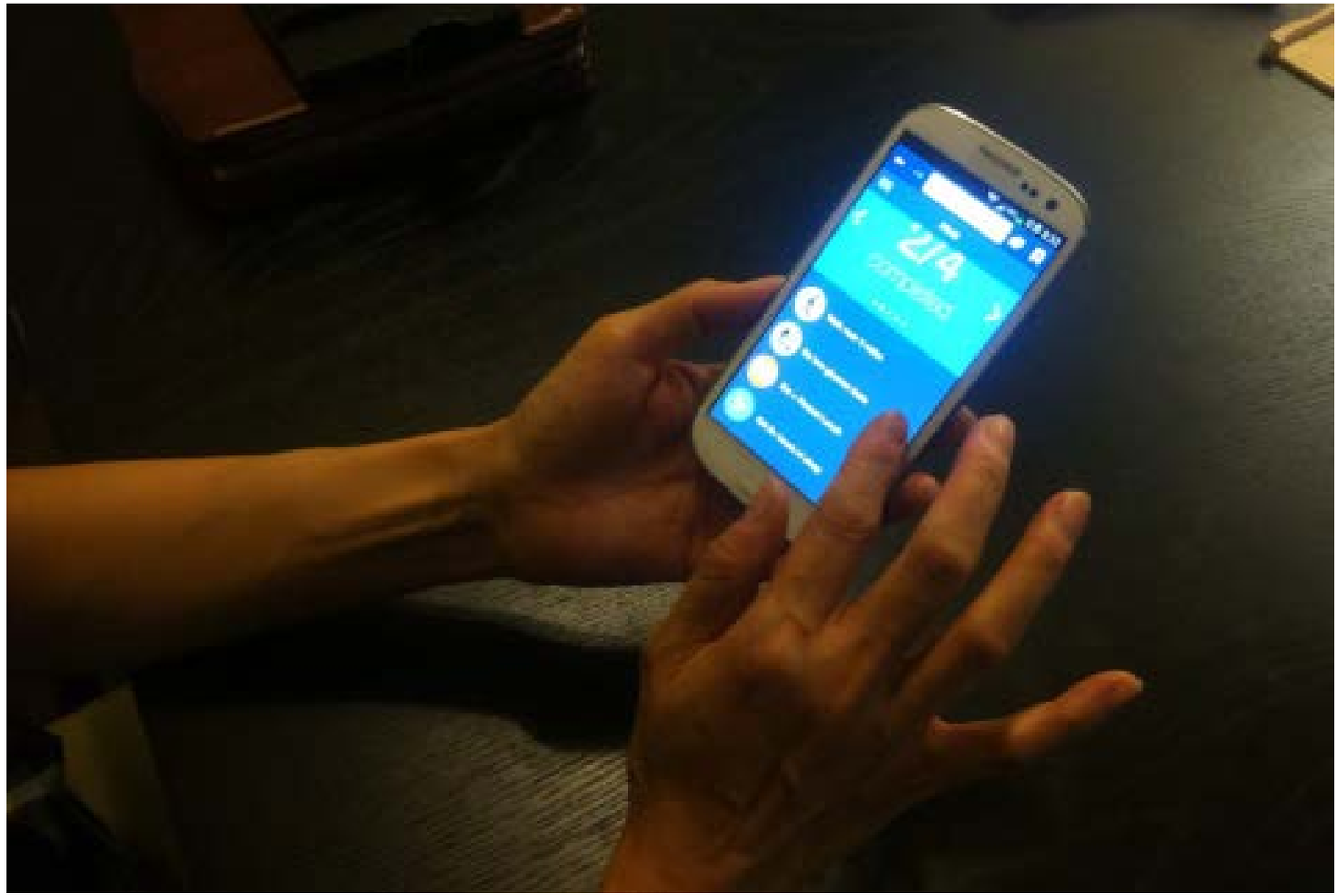
Interview + Feedback



Jee said many patients who have diabetes are around 40 or older than 40 years old, which means they are farsightedness due to old age for seeing this small map on phone's screen. Same as Jee, she was having difficulties to seeing this map. She recommended to show the words rather than map.

Interview + Feedback

There is a goal she has to complete. one of the goal is eat lunch and record it. She said it would be better if this device could analyze her current blood sugar level and suggest her the list of food that her blood sugar level stays on safety level after eat.



Interview + Feedback

Jee liked the idea of peanut. She liked it because it's easy to carry and she doesn't need to take several steps to test blood sugar level.

Interview + Feedback

Jee Park

Background
Jee is 52 years old and having diabetes for 3 years. She spoke out the problems about how diabetes impact on her daily life. She also complained about the cost of supplies she buying, food habit, amount of exercise, and lifestyle changed since she had diabetes.

Mood Board

Keywords:

Embrace Emotion Connection Touch Peace Warm Hope













Keywords:

Comfort

Style Guide

Layout

Design Elements

Hierarchy

Iconography

Typography

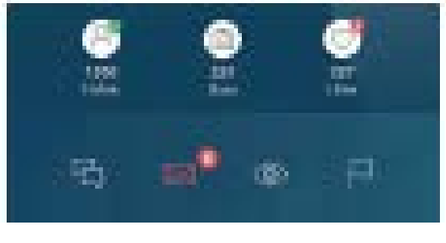
Color Pal.

Layout

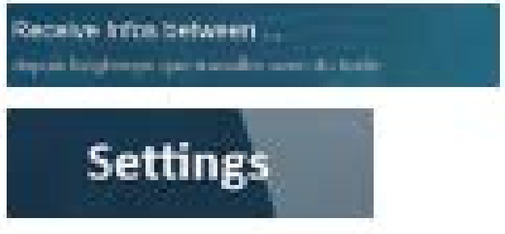
Design Elements

Hierarchy

Iconography



Typography



Color Pal.

Layout

Hierarchy

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Typography

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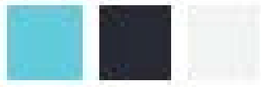
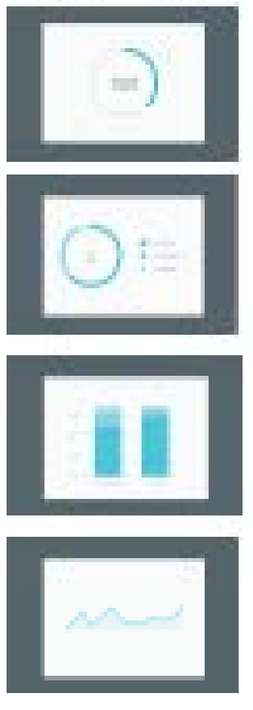
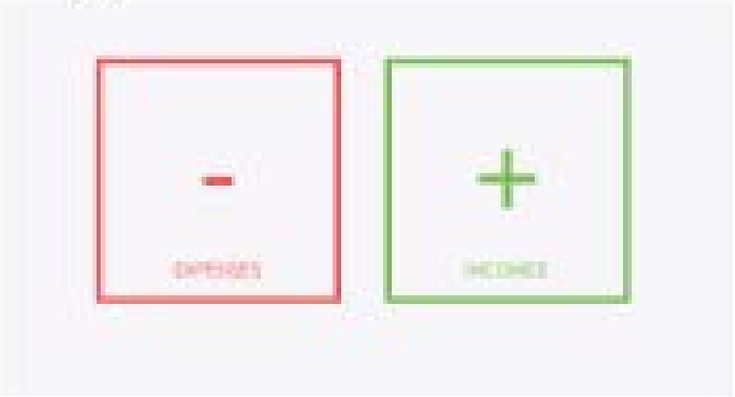


Design Elements



Layout

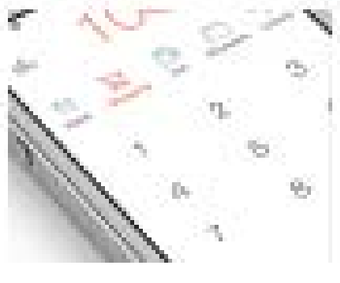
Design Elements



Hierarchy

Iconography

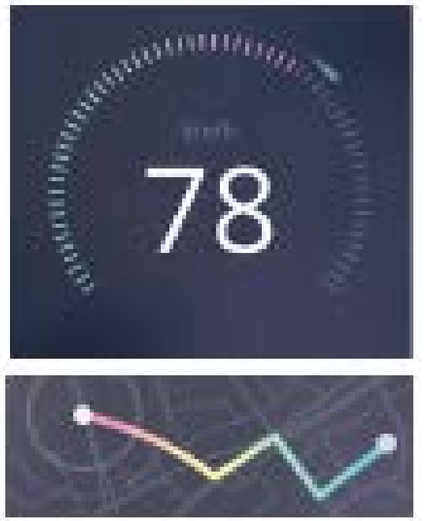
Typography



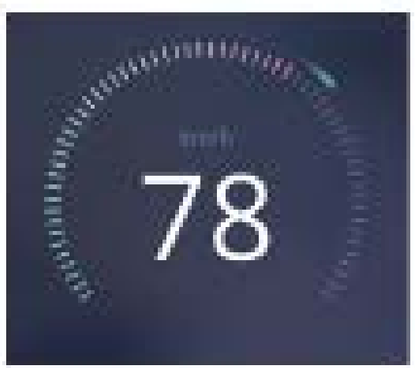
Color Pal.

Layout

Design Elements



Hierarchy



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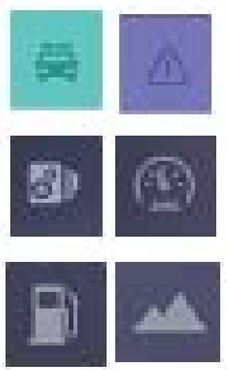
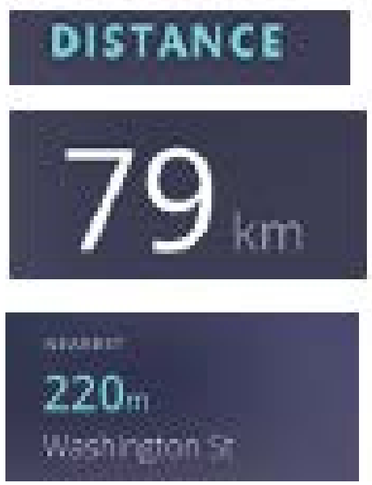
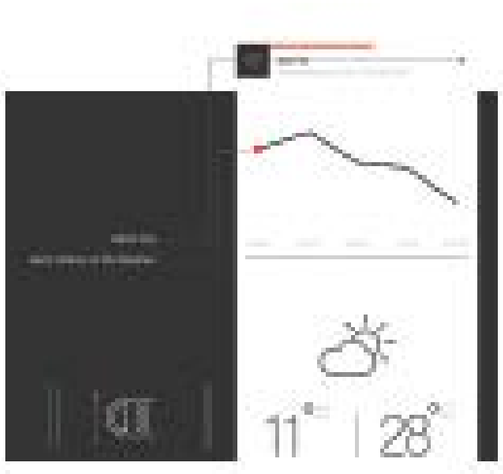


Typography

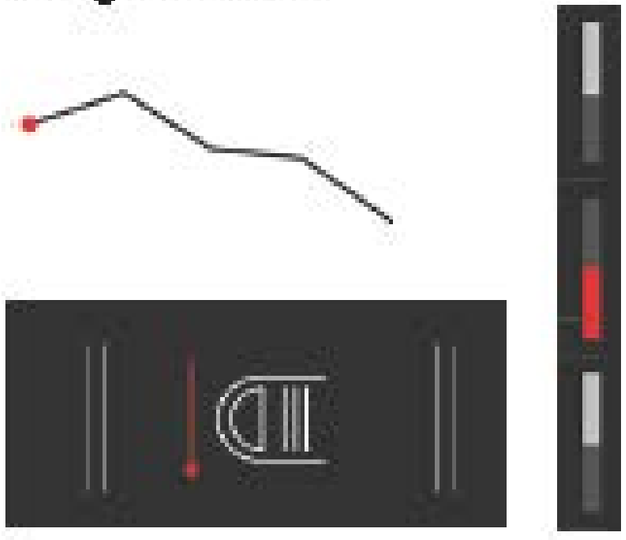


Color Pal.

Layout



Design Elements



Hierarchy

Iconography

Typography

SOFIA

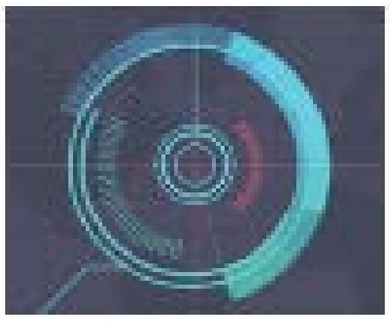
Wednesday 15:28 / 22.05.2013

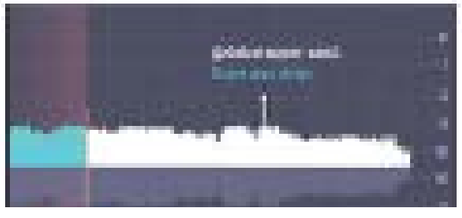
Color Pal.

Layout

Design Elements

Hierarchy





Iconography

Typography

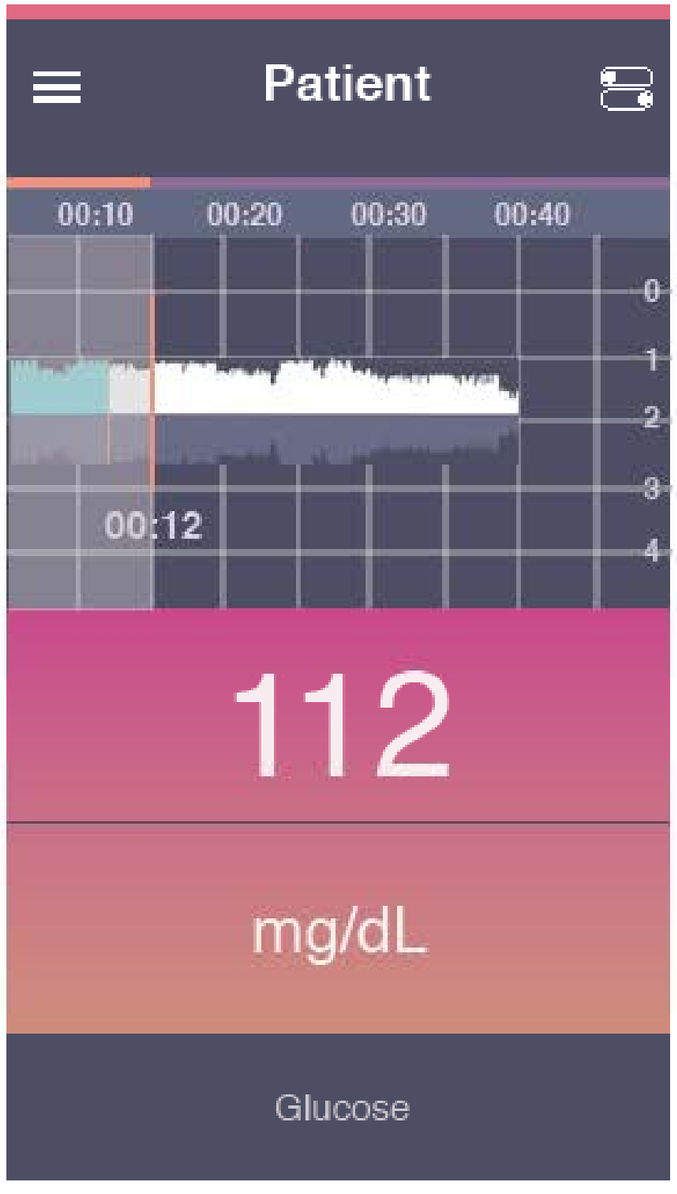
San Francisco

Listener

46/25
Minutes

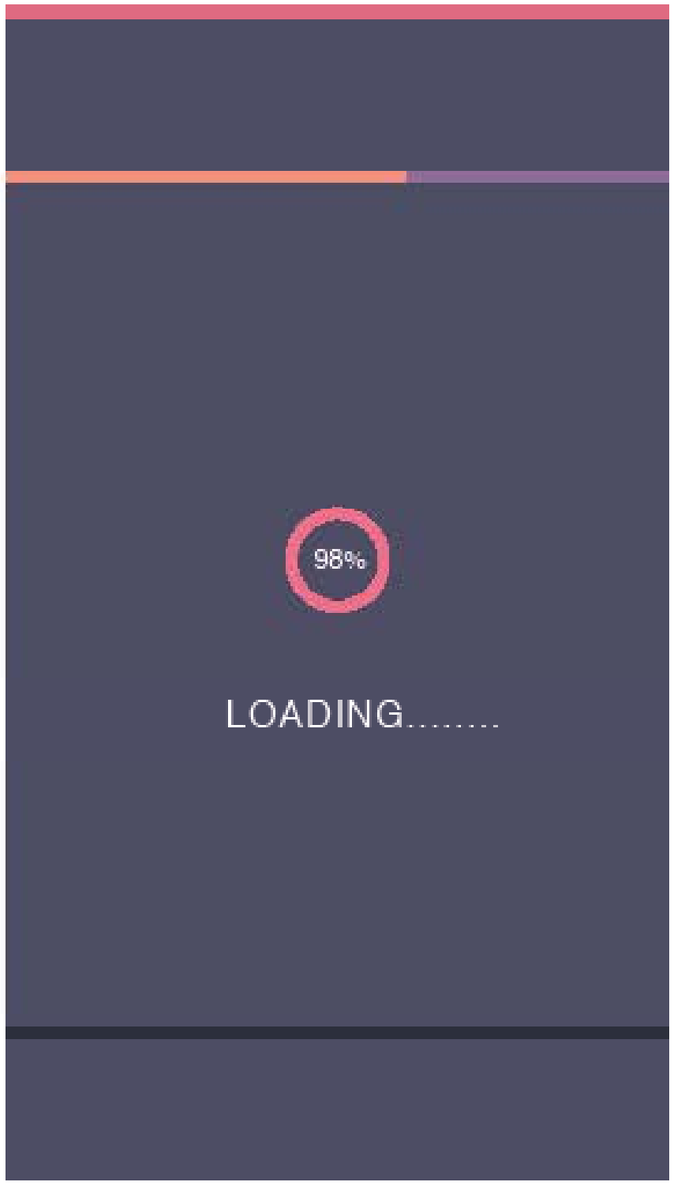
Color Pal.

Mastercopies



High Traffic

Info Rich



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Info Rich

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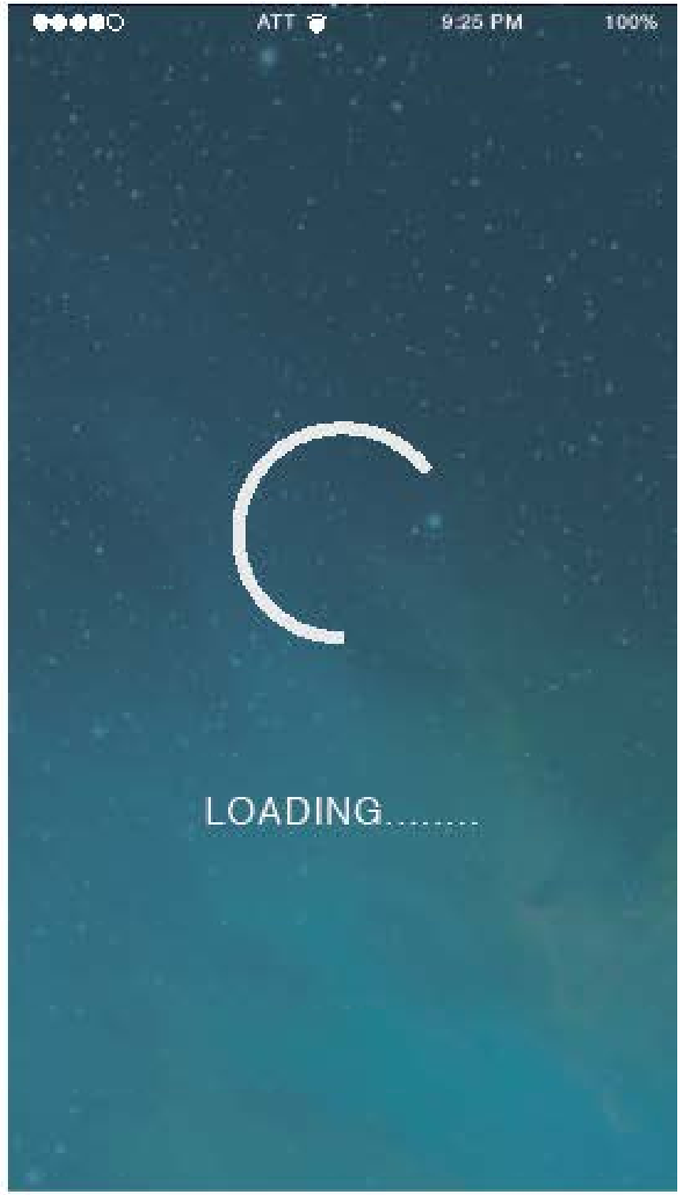
High Traffic

Info Rich



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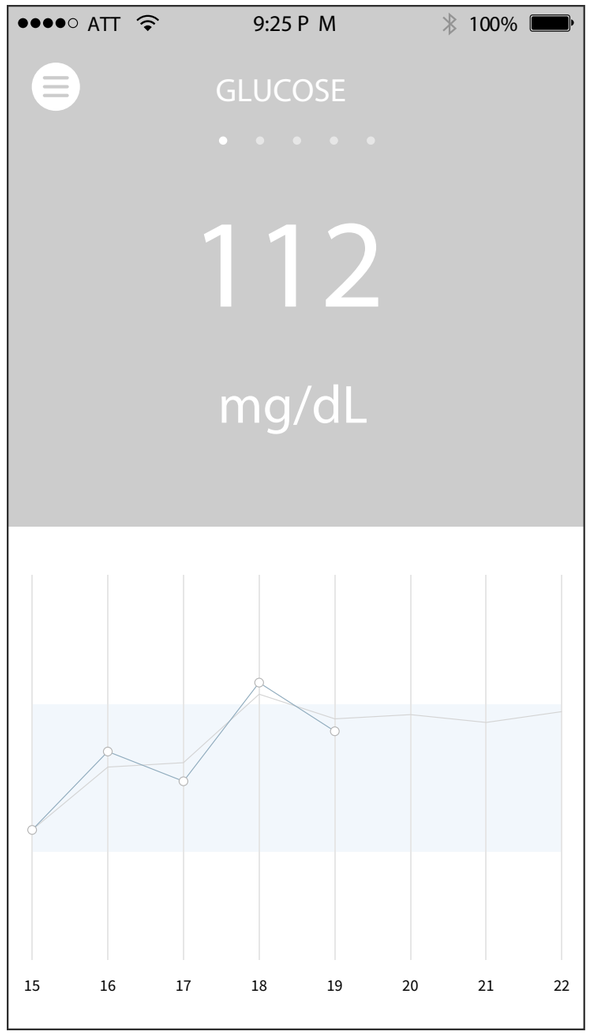
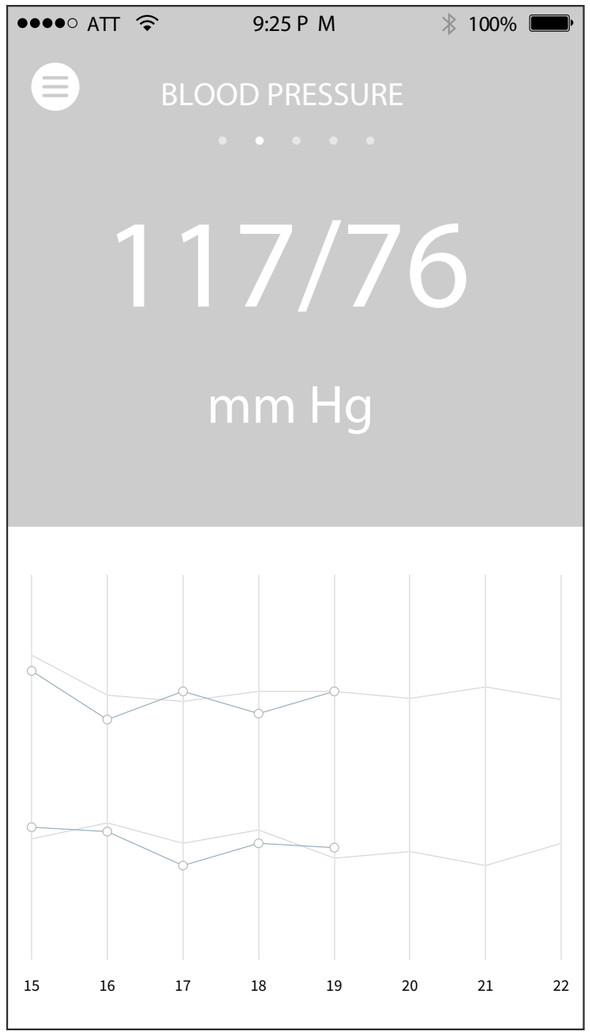
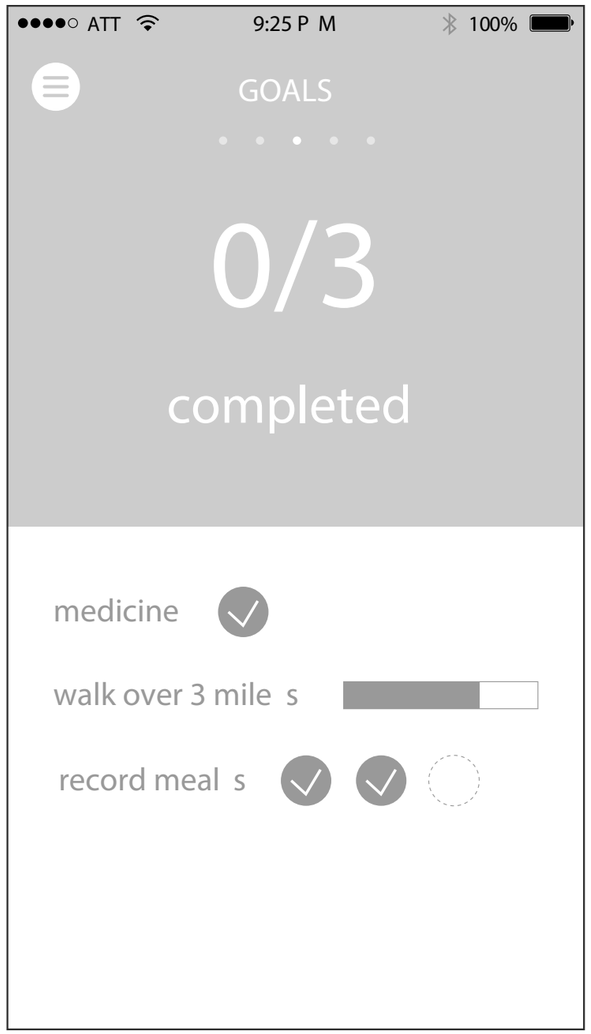
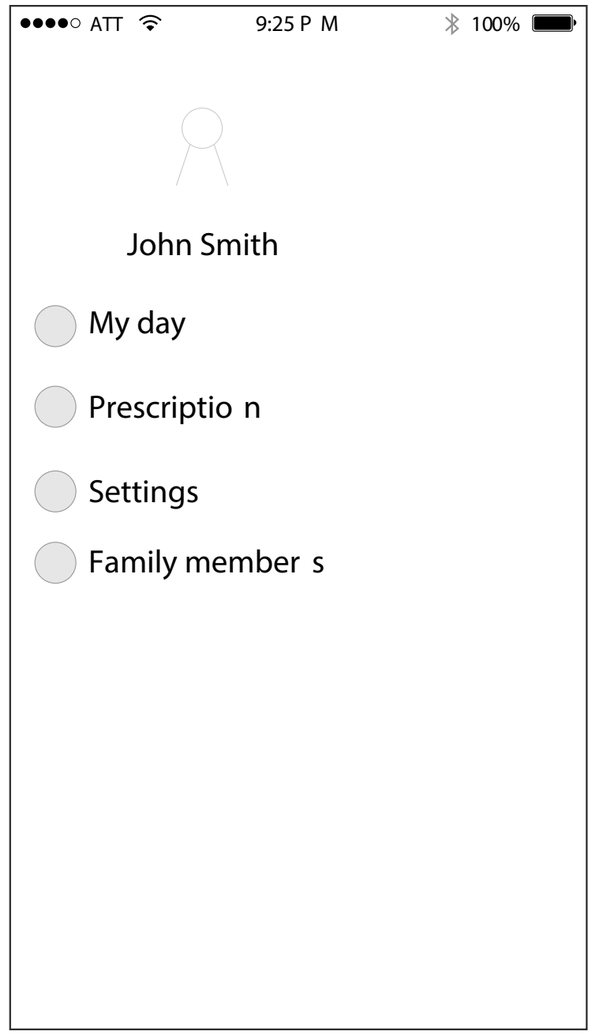
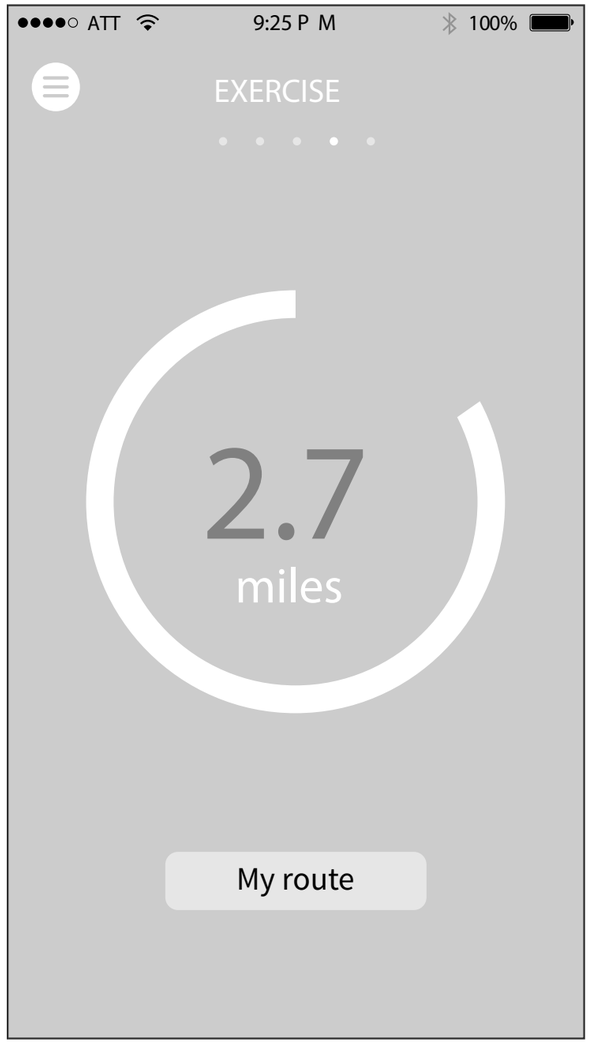
Wireframes

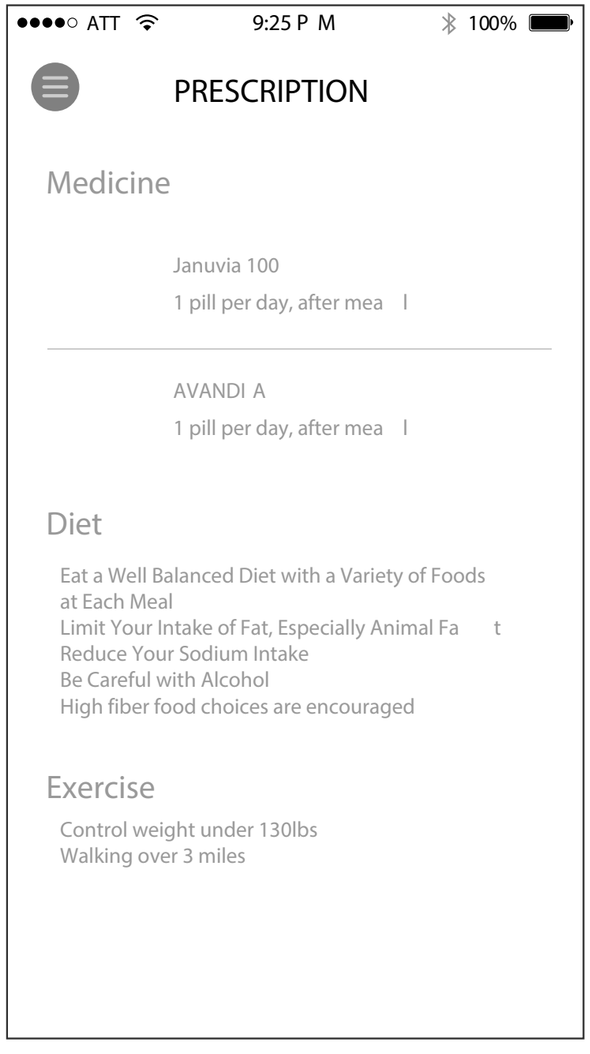


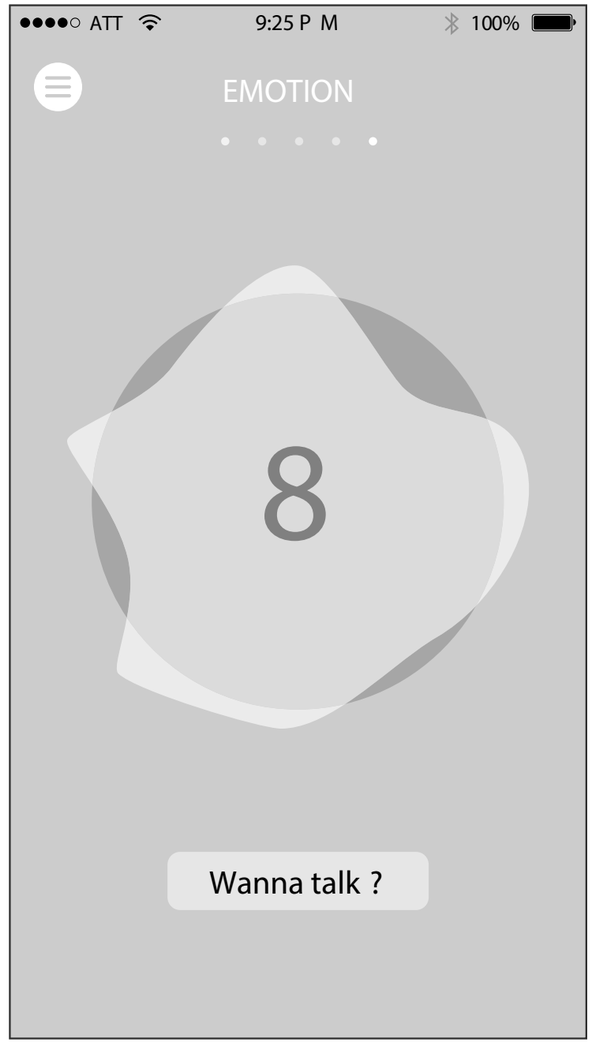


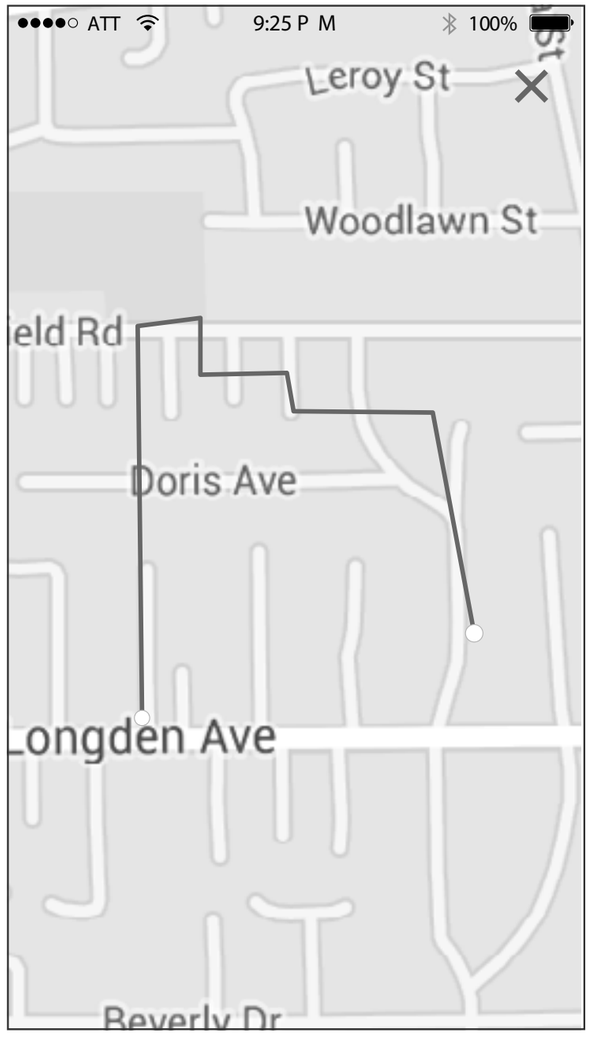


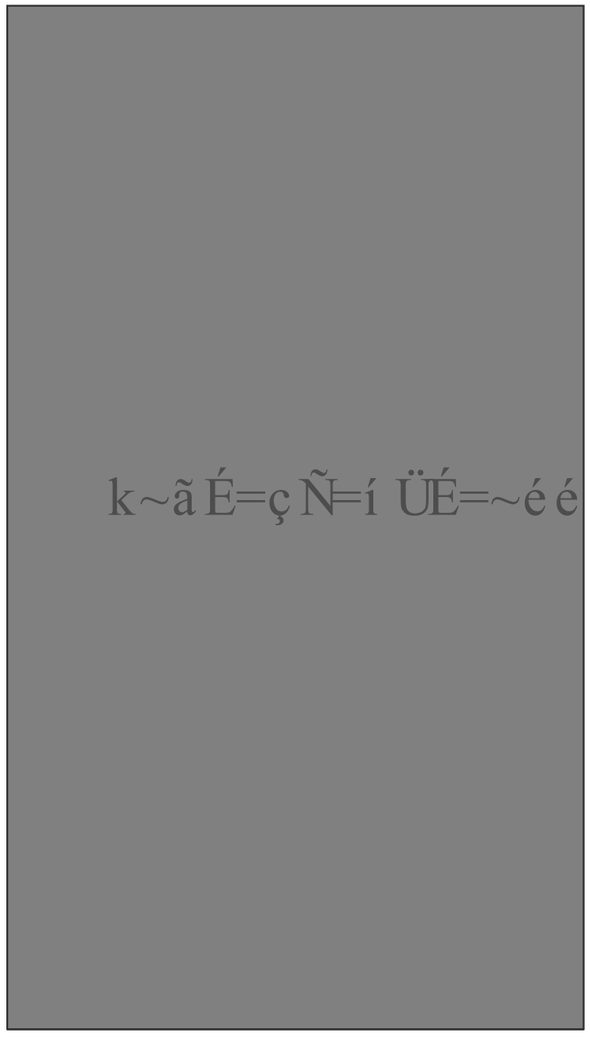


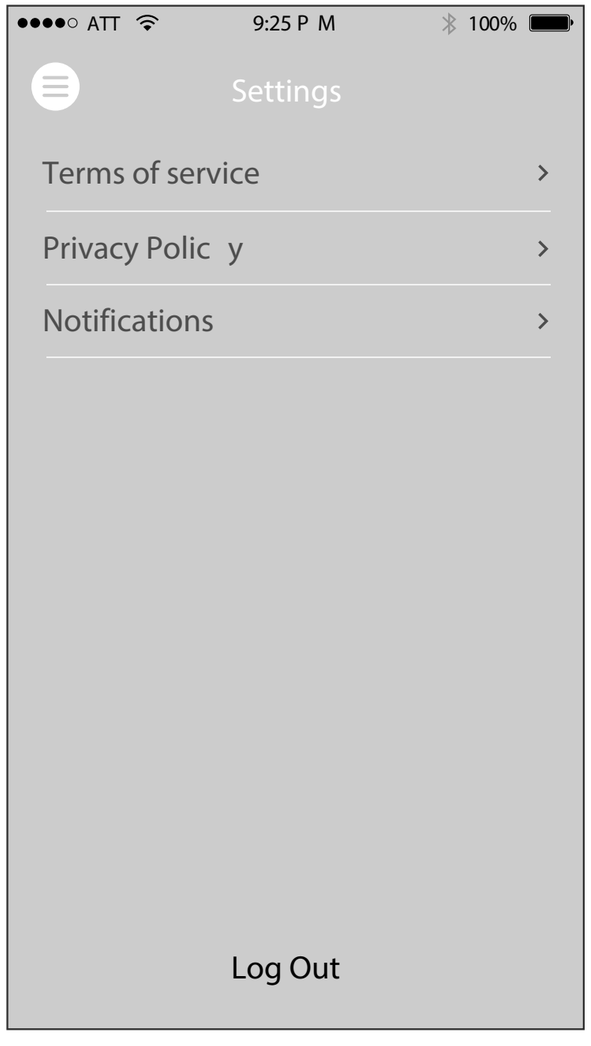


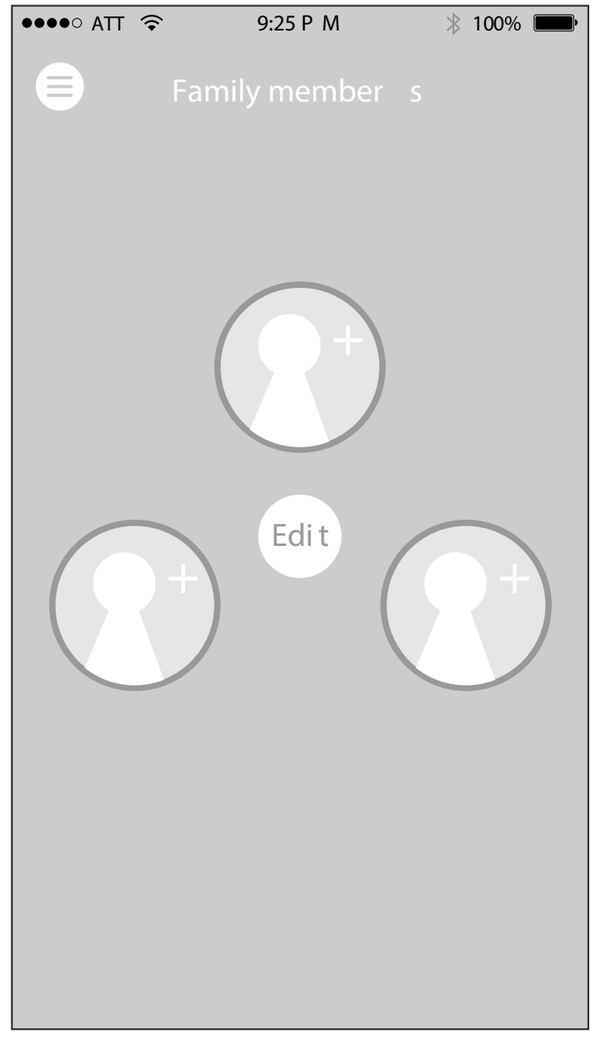


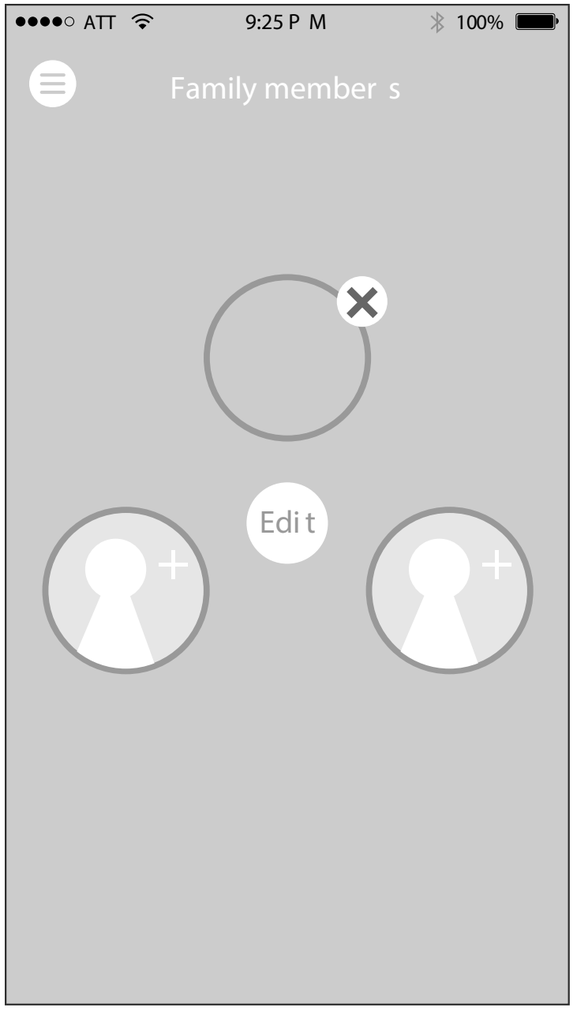












Flowboard

Scenario

Scenario

01. Will is 35 years old. He plans to visit a local hospital to get a check-up, since he feels tired all the time, and work has been feeling very inefficient for him recently

02. Will meets with Dr. Claudia, and she asks will to do a blood test and urine examination so that she has a better idea of what exactly is going on.

Scenario

03. Will comes back in a week, and meets with Dr. Claudia to understand whats going on. She delivers the bad news that Will has been diagnosed with type 2 diabetes. Wills face goes white

04. Dr. Claudia assures will that diabetes is not life threatening if death with appropriately. She explains the basics of diabetes and tells will that he will have to make changes to his lifestyle to cope up with the changes he will have to make in order to regulate the diabetes.

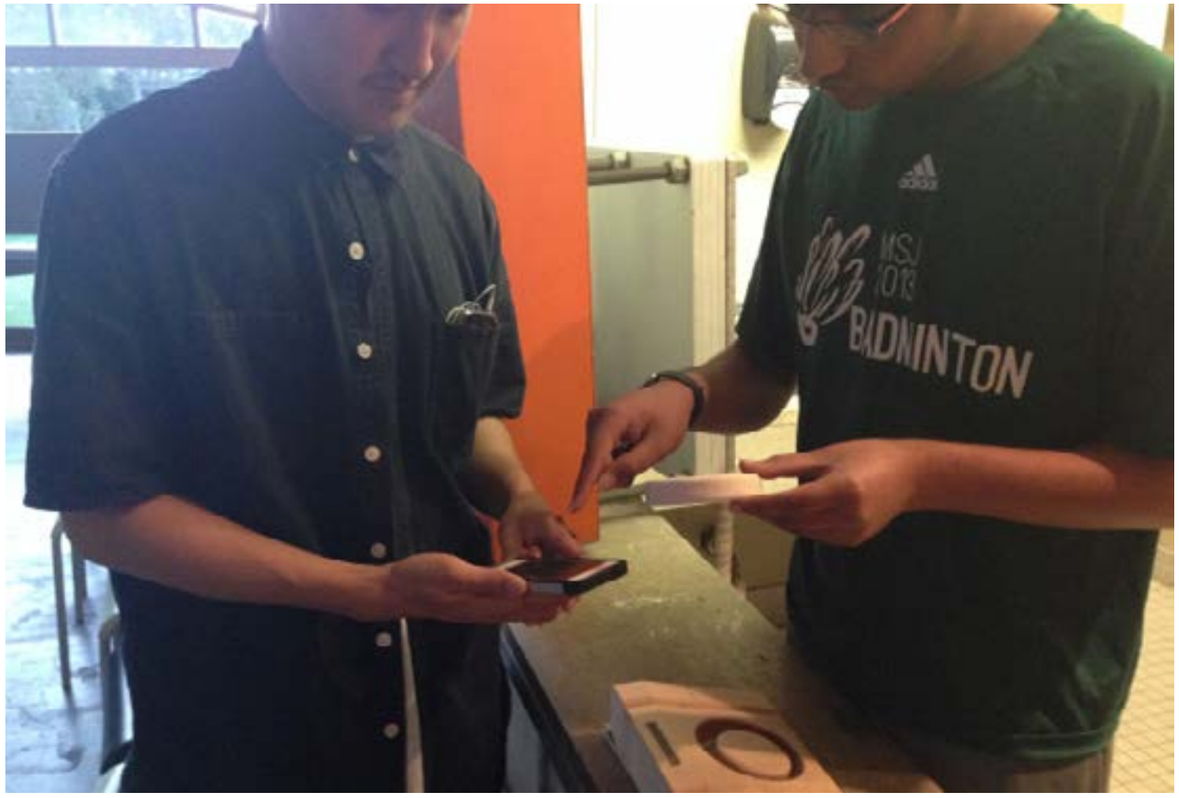
Scenario

05. Dr. Claudia then prescribes Will's exercise and medication and sends a link to a 'D-Coach' application. She explains that this application will work with a special device which he will learn more about from the nutritionist and can pick up from the nurse. Dr. Claudia then tells Will how this new device will help him adjust to his new lifestyle. Will downloads the application.

06. Will also stops by the nutritionist, and get's instructed on how he should manage his diet. He also does a demo on how the diet management system on the 'D-Coach'application would work.

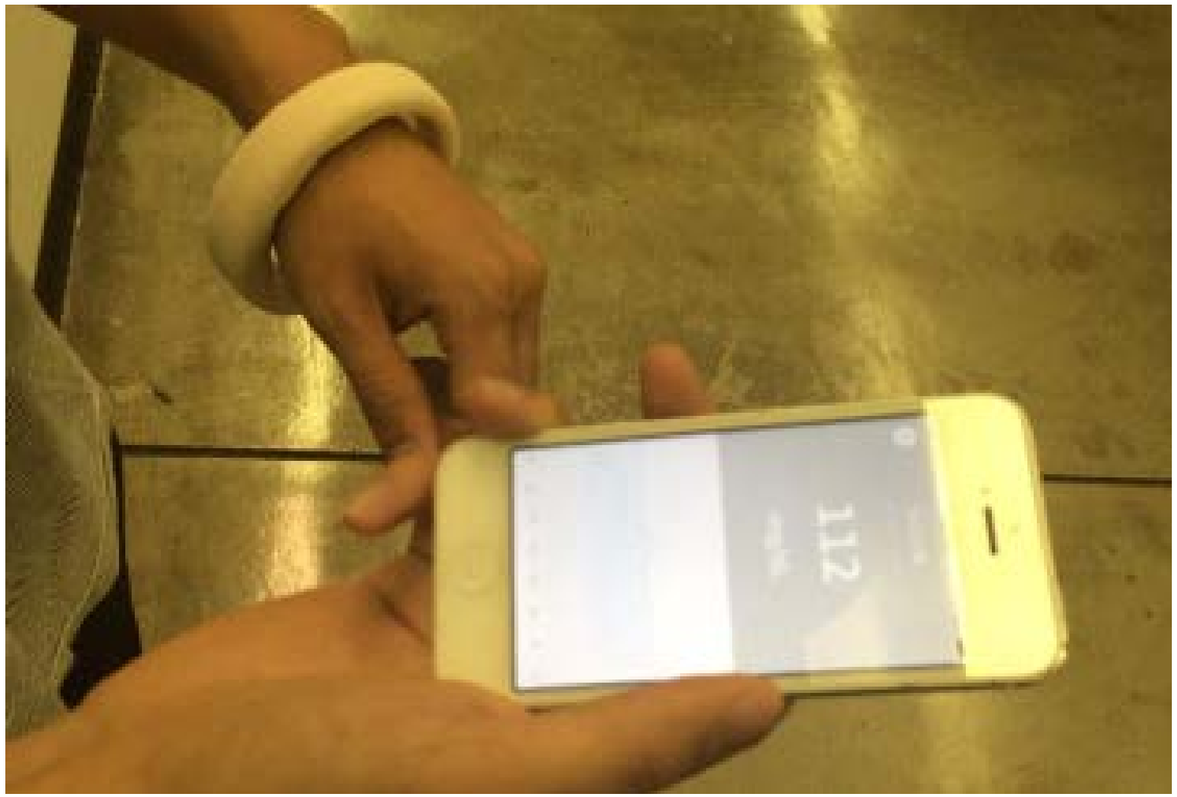
Scenario

07. Before Will leaves the hospital, he visits the nurse and receives a ‘D-Coach’ bracelet and a home device. The nurse briefly explains that the bracelet will record his daily activities and health condition, and that the device will give him advice to make adjustments to his lifestyle everyday.



08. Lastly, the nurse instructs him to connect his bracelet to his cell phone application via Bluetooth. He would have to return it in 3 months when he comes back for an appointment

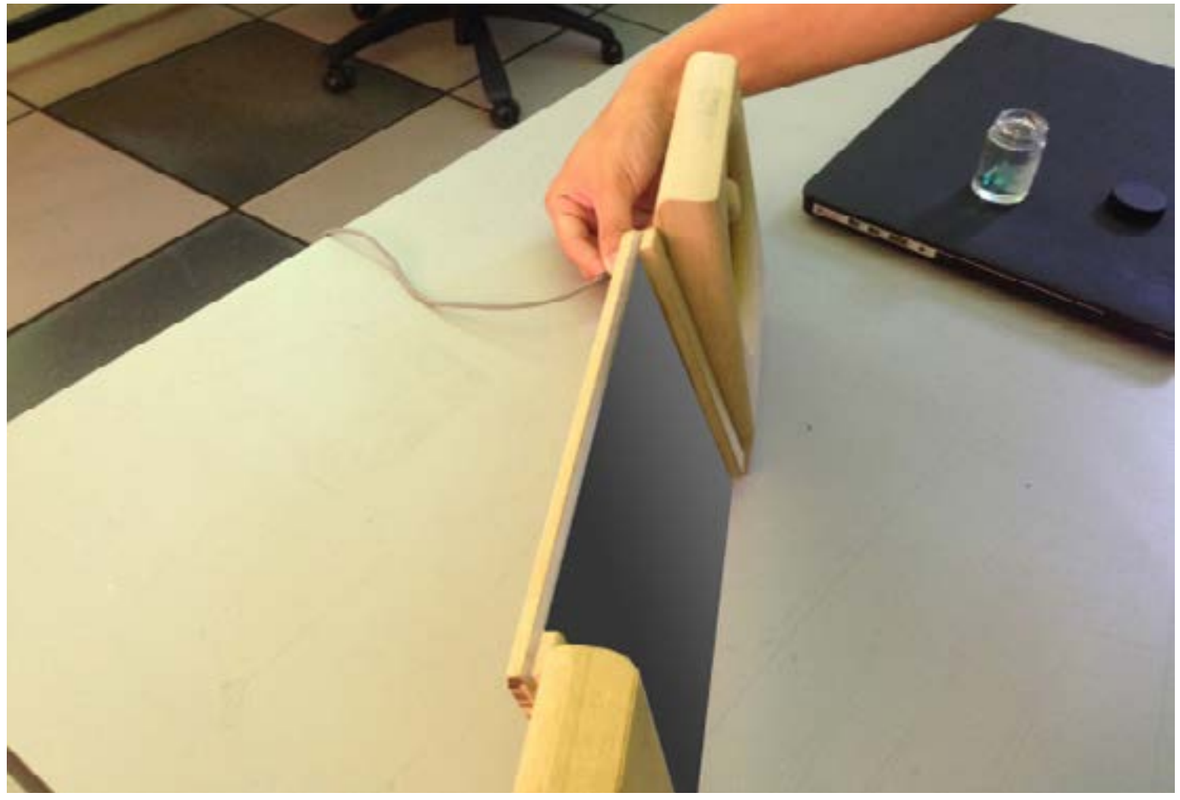
Scenario



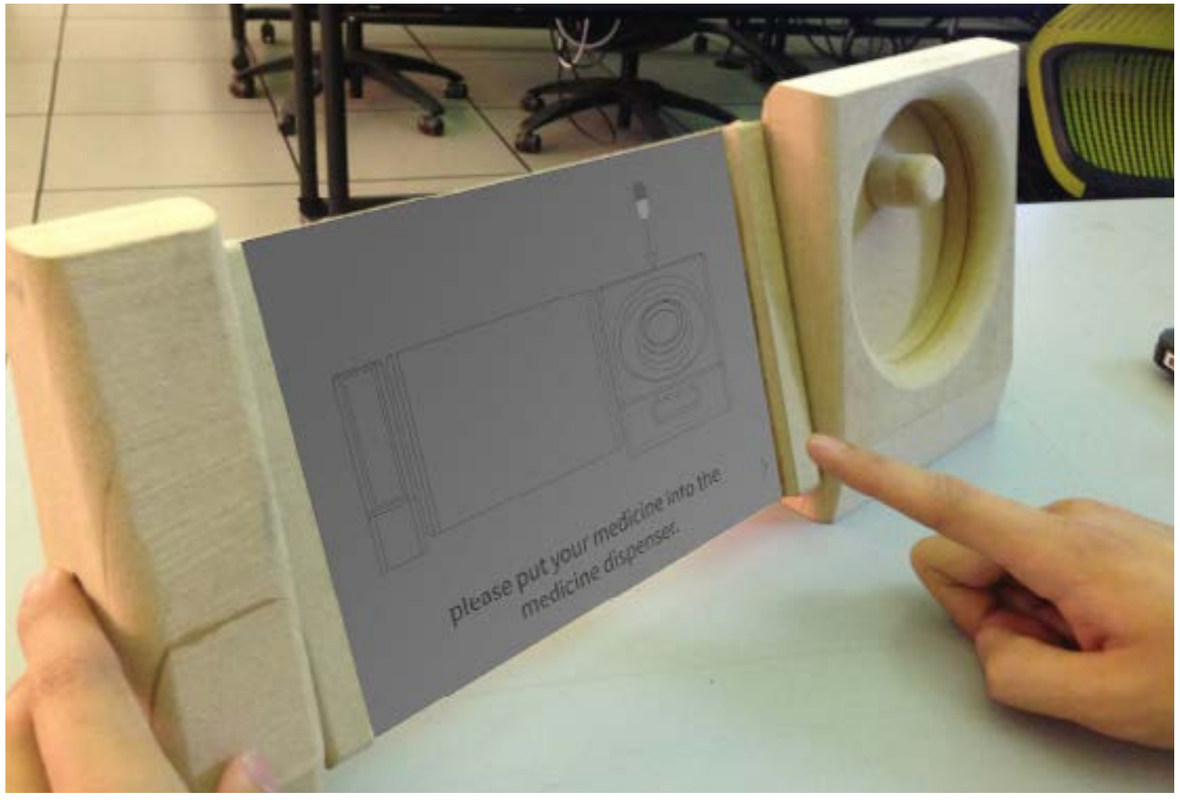
09. Will wears the bracelet and connects it with his cell phone application. The bracelet will track his glucose level, blood pressure level, and exercise rate. The data will be shown on his cell phone application and help Will to better understand his physical condition.

10. He goes to the nearby pharmacy, and shows the prescription of 500mg metformin on his cell phone application, which was prescribed by Dr. Claudia.

Scenario

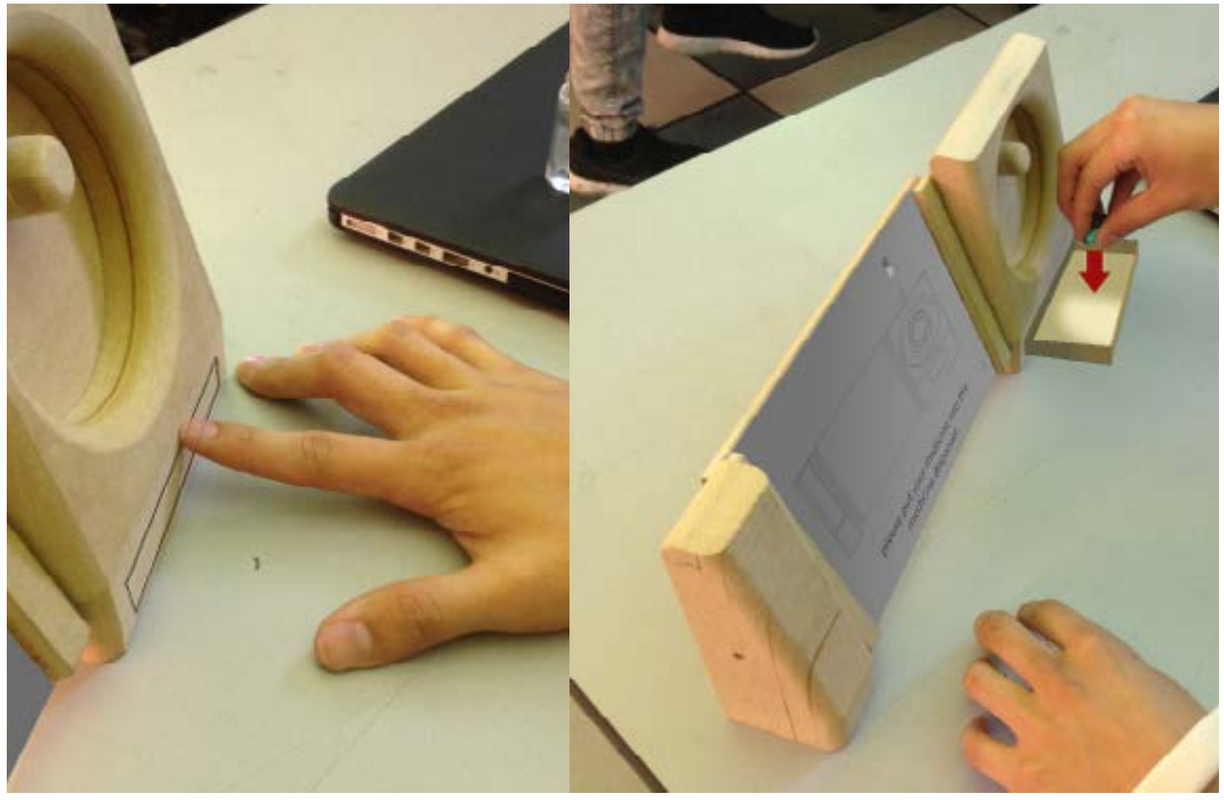


11. Will then returns back home after an emotionally draining morning, but is eager to set the device up. Once he does that, the ‘D-Coach’ welcomes him.

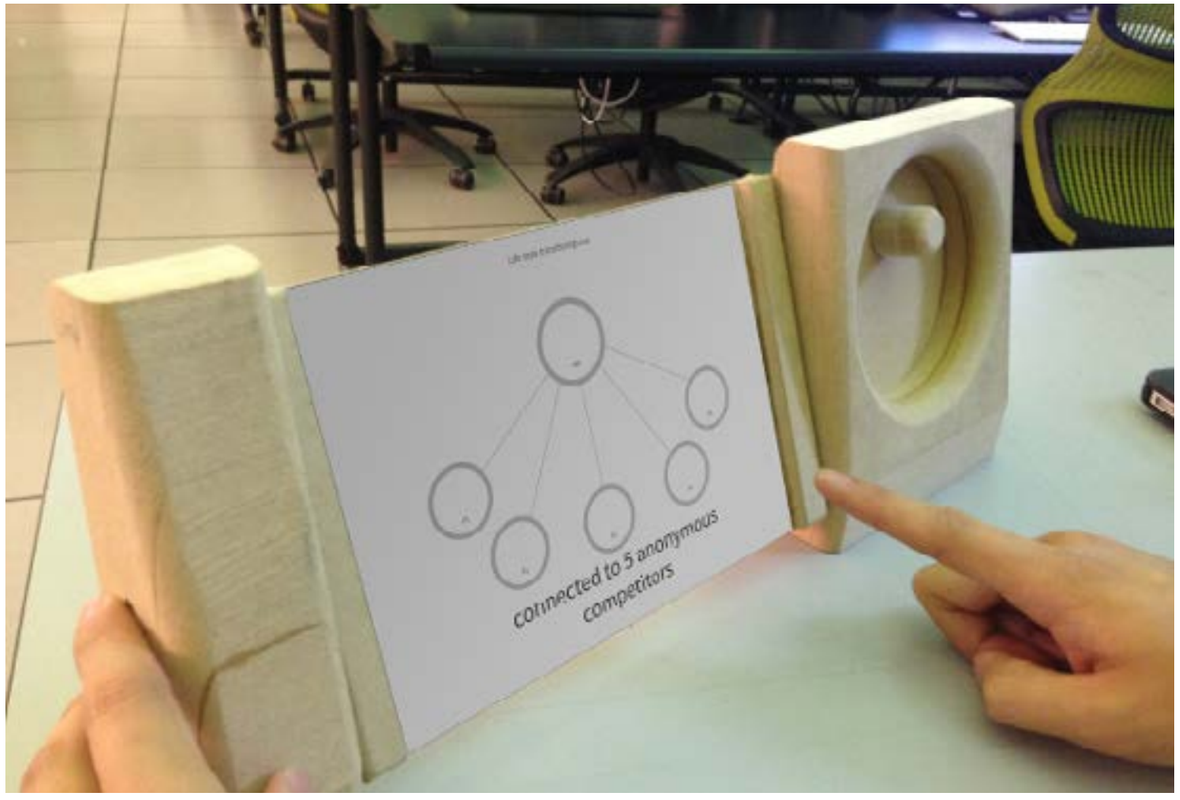


12. The device is in a set-up mode and walks him through a quick tutorial of the different features, and medicine dispenser.

Scenario



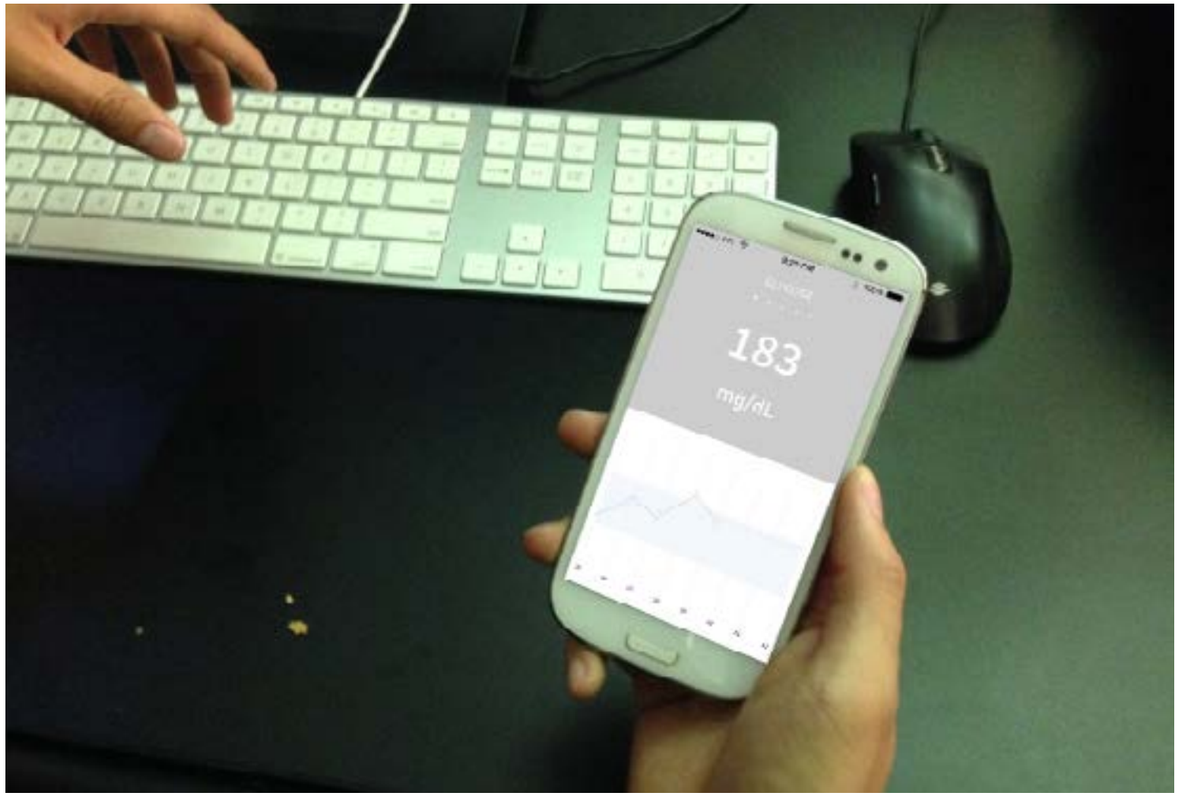
13. Will then loads his metformin into the device, and instructs it to dispense the medicine at 8am and 8pm respectively, as per the doctor's orders.



14. As Will is browsing the interface, he stumbles upon the life-style transition group and decides to take part. He is brought to a quick info page that tells him that he will be connected with 5 anonymous individuals who he will compete against during his transition and adjustment to his new lifestyle.

Scenario

15. After everything's been set up, Will feels hungry. He wanders around his kitchen, and comes across a Reese's chocolate pack. Will has a sweet tooth, and eats the entire pack without thinking twice.



16. Will then decides to head out and meet his friend. As he takes his phone out, he notices an alert that says his glucose level is high (183mg/dL). He feels fine, so he just ignores the message and puts the phone away.

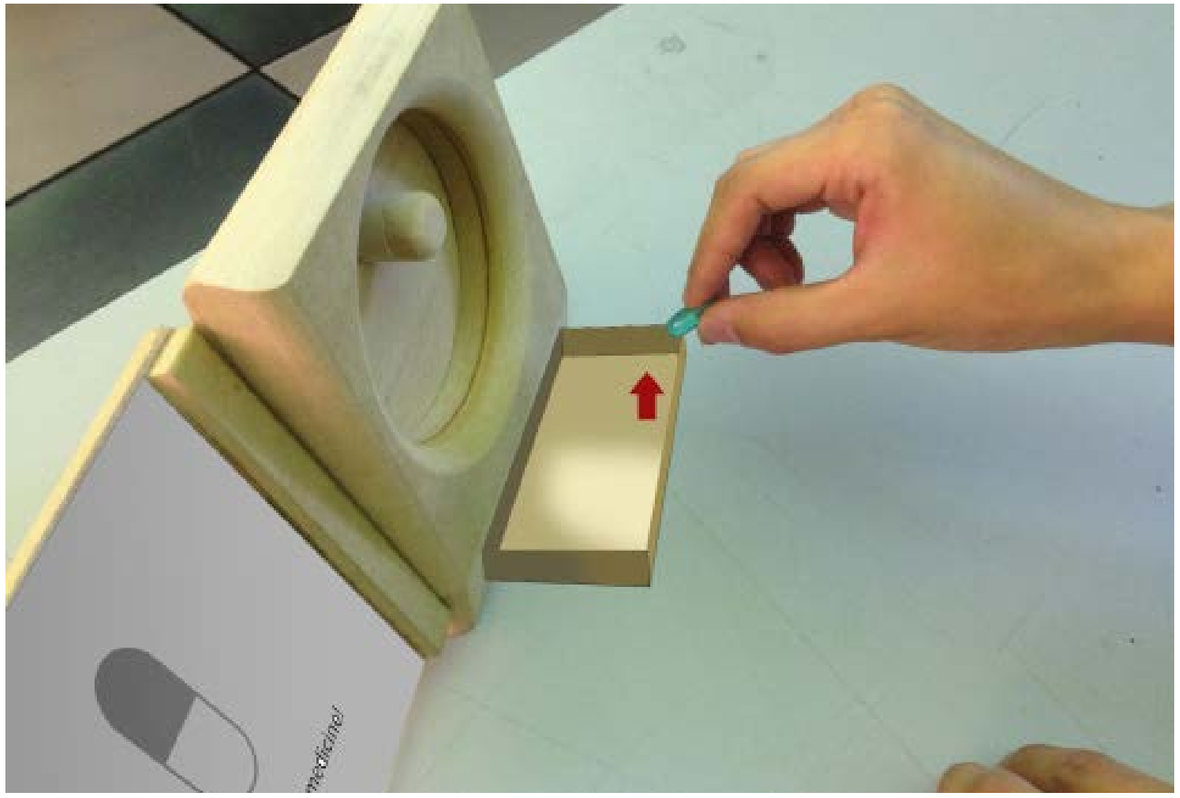
Scenario

17. After hanging out with his friends for a bit, Will decides to grab some dinner. He walks into BJs. The moment he walks in, he gets a buzz on his phone, which recommends him to have the salad there. He is alerted to the fact that his blood sugar level is still high at 158mg/dL.

18. He reluctantly selects garden salad on the menu, and the app automatically adds a picture and info. It also aggregates this information along with the rest of his data to provide a better outlook on his health for the day.

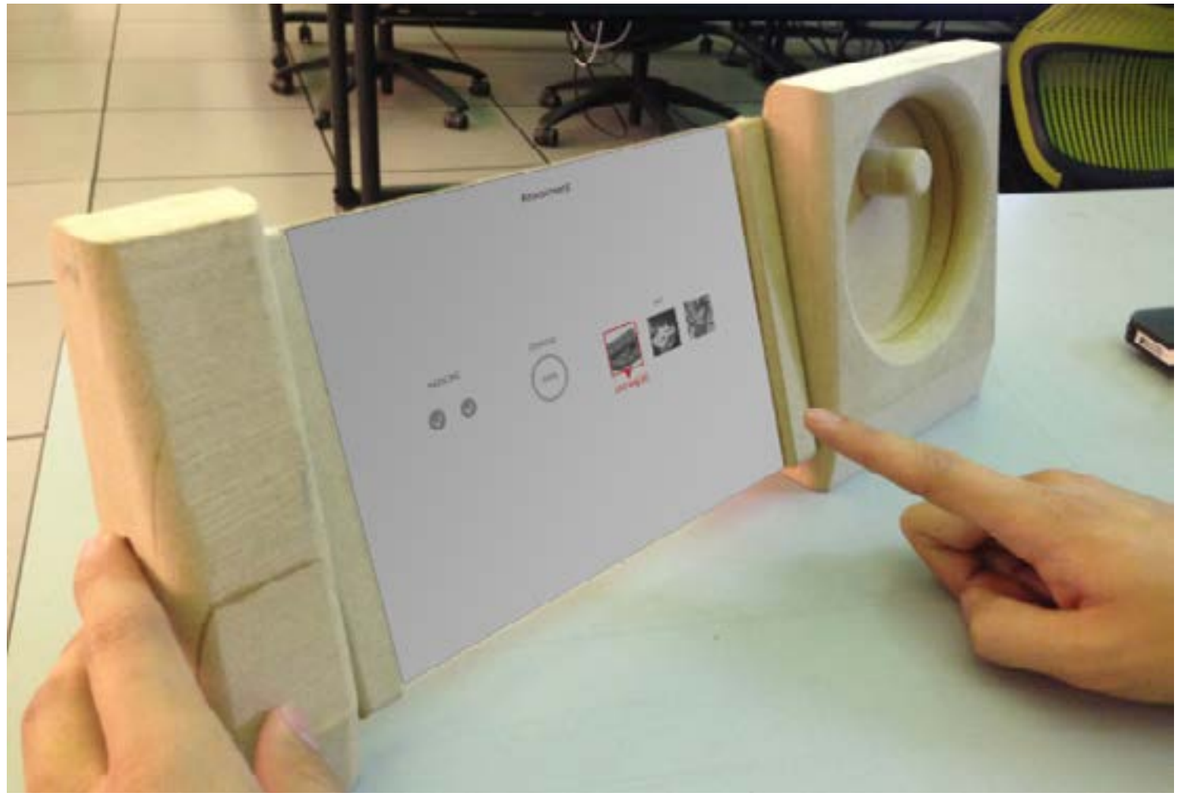
Scenario

19. Will comes back home around 9 p.m. As he walks into his room, the coach lets him know that he should take his medicine.

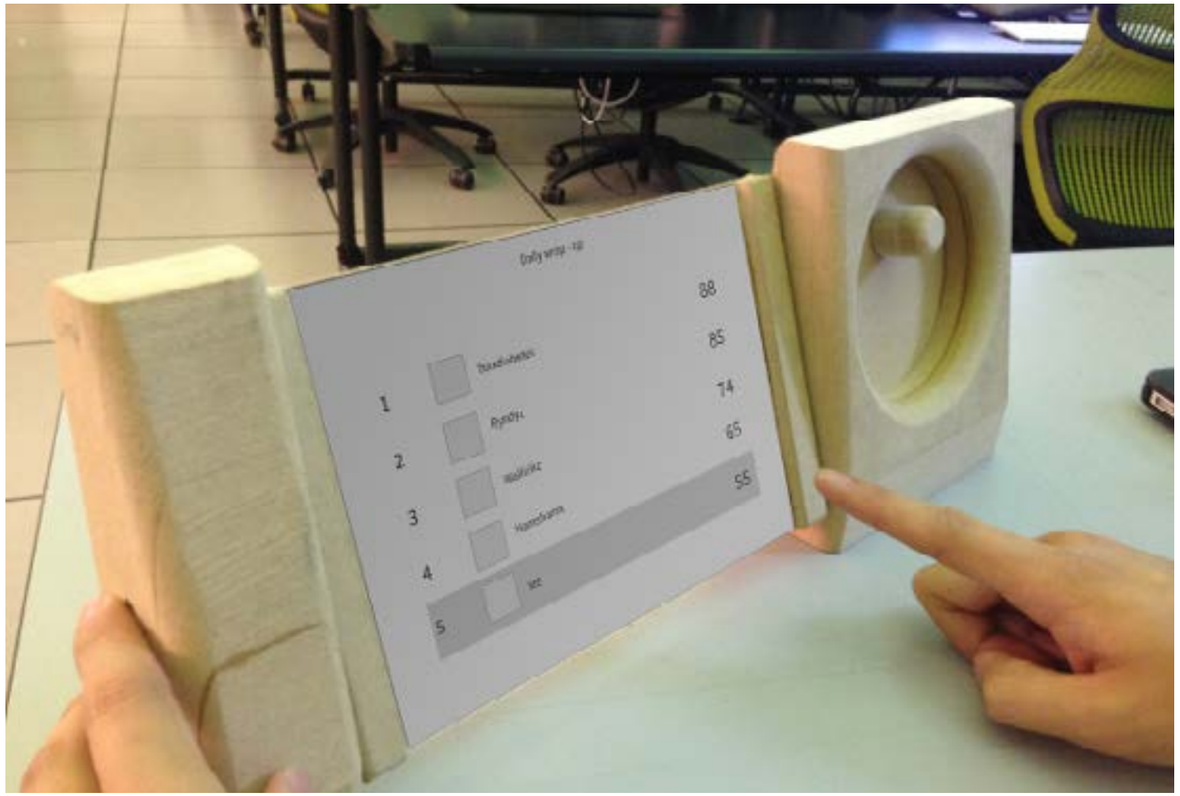


20. He removes his metformin out of the dispenser, and takes it. As he does that, the coach signals to Will that it wants to talk to him about the day.

Scenario

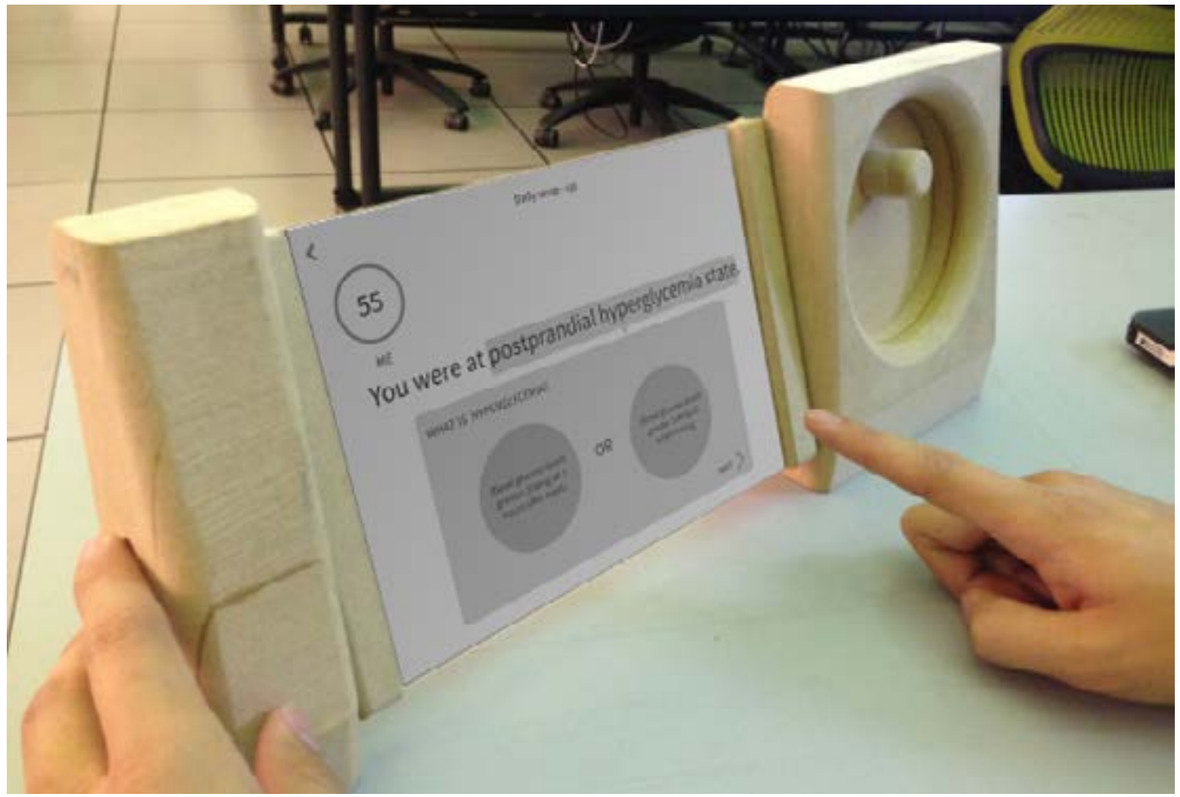


21. Will flips the screen and checks up on the coach's assessment of his day. Will sees that he has taken his medicine as scheduled, and walked enough; while he was meeting his friend. However, as he scrolls down, he sees a red mark on his diet. He sees that this is due to the chocolate he had earlier, when he was alerted with high blood sugar level.

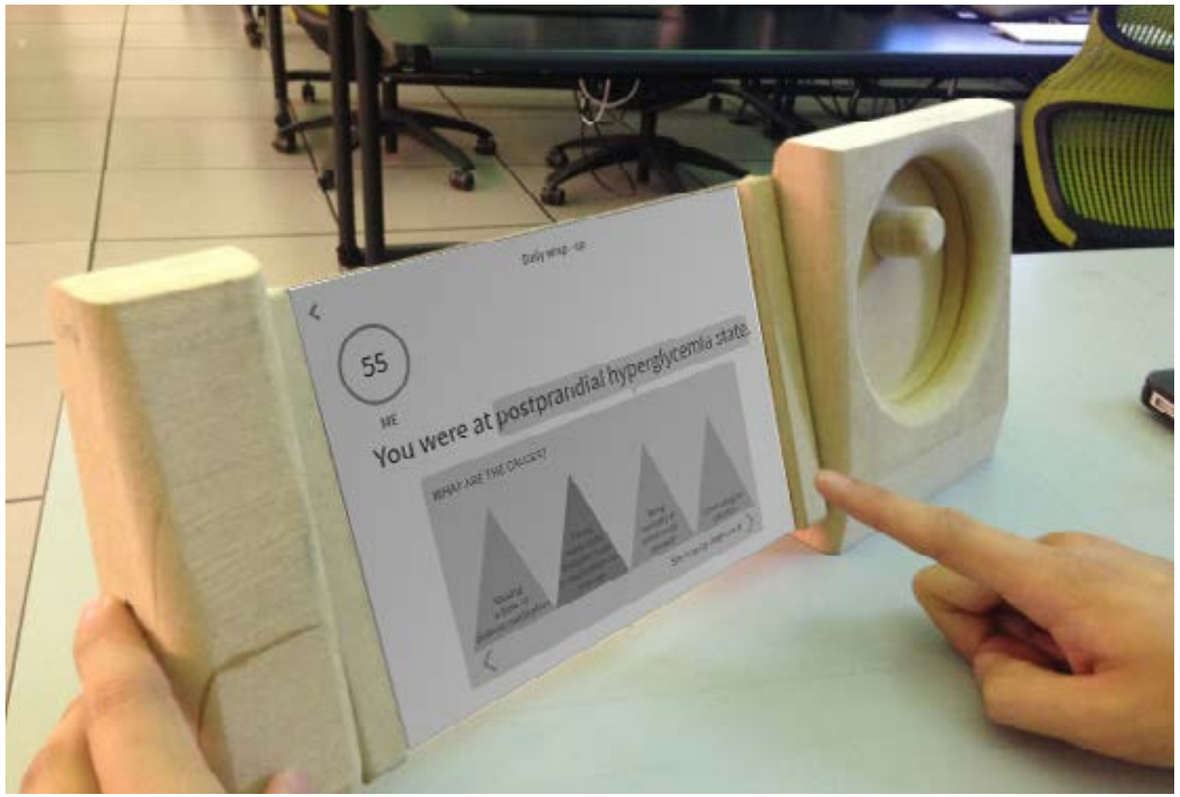


22. Will then scrolls down to the end and presses the daily wrap-up button. The lifestyle group screen appears along with his score of the day. He achieved 55 points out of 100, and is ranked 5th in his group.

Scenario



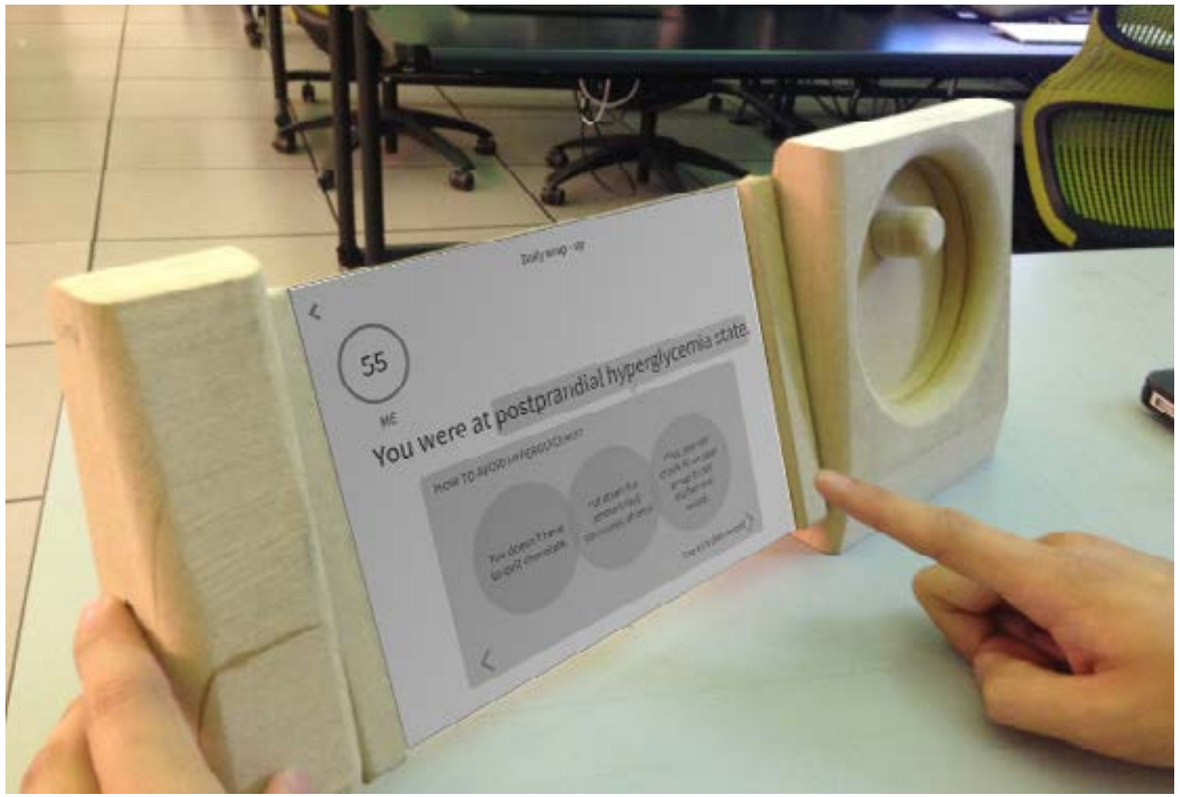
23. He presses his score, which is glowing, and is alerted to the fact that he was at a postprandial hyperglycemia state during after noon due to chocolate consumption.



24. Will is unfamiliar with the term, and quickly gets worried. He presses the info tab next to the word, and is lead to an info screen about postprandial hyperglycemia.

Scenario

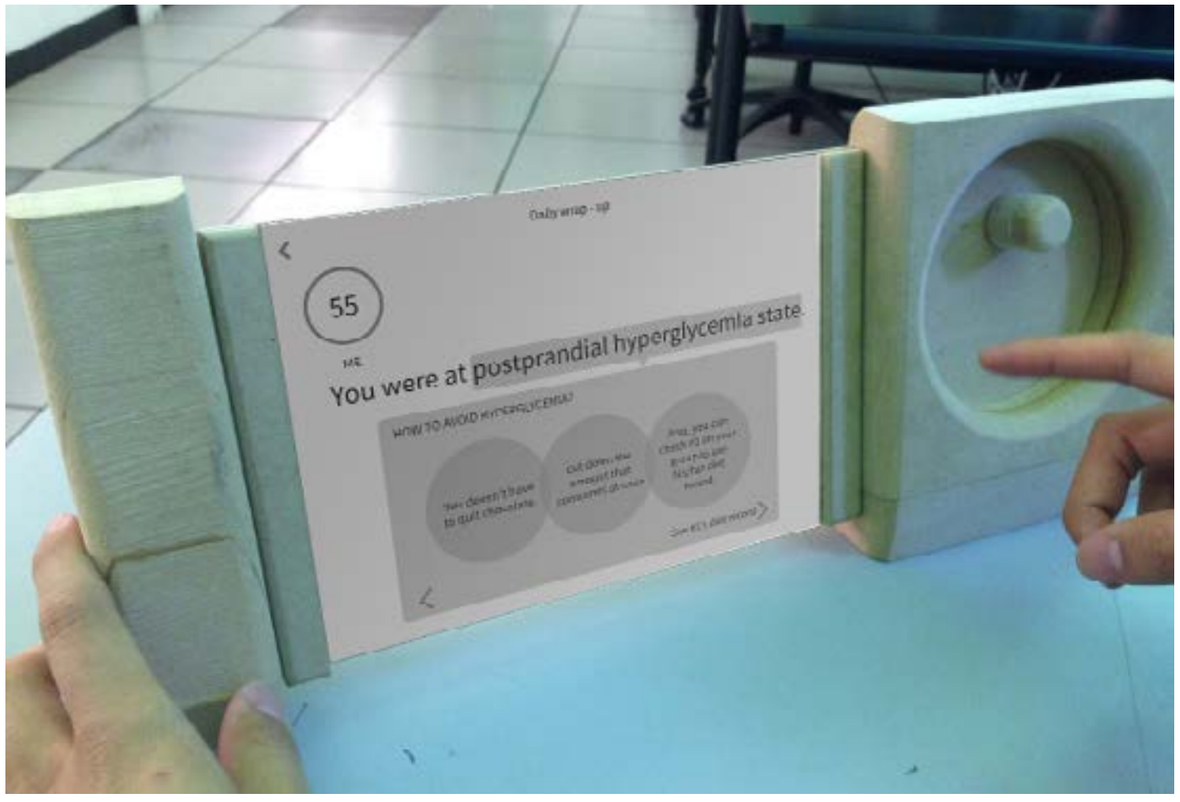
25. The coach lets him know that postprandial hyperglycemia is caused due to large calories of meal consumed at once. He now knows that he had too much chocolate.



26. The coach leads him to the next screen, which warns him that frequent hyperglycemia can cause ketoacidosis, which can be life threatening for a type 2 diabetes patient.

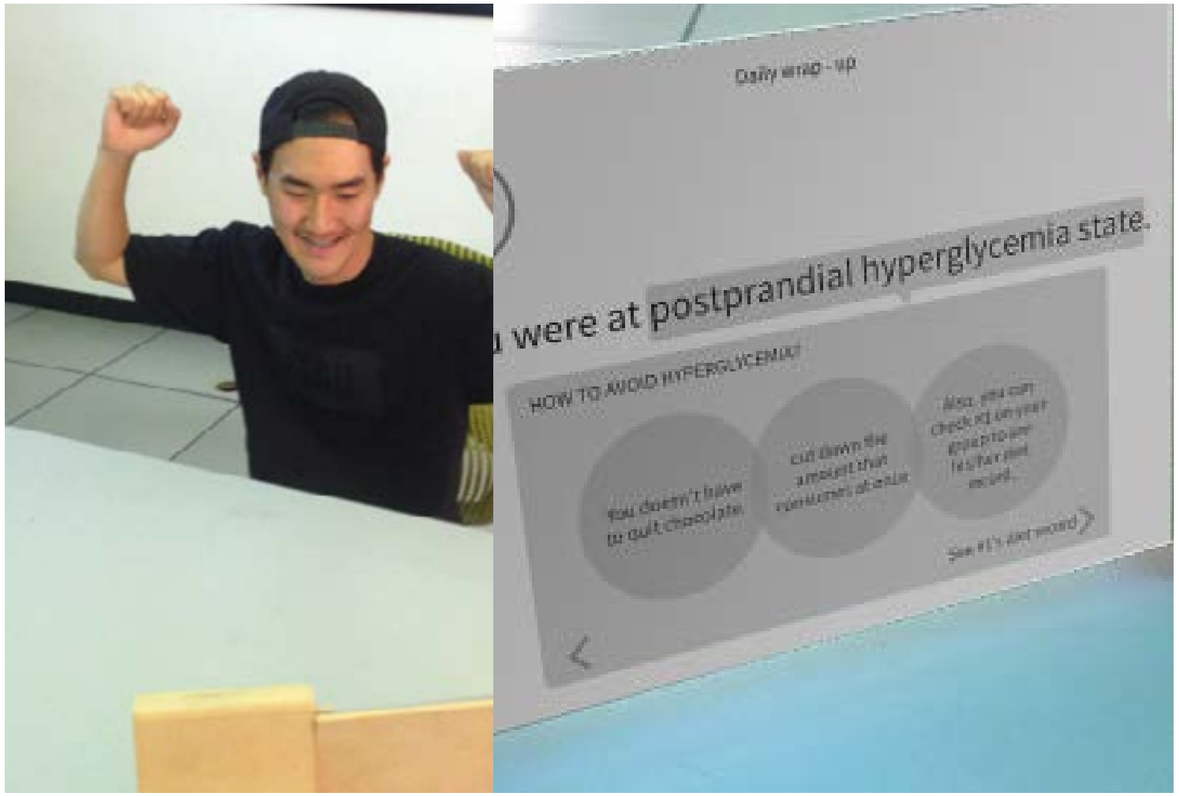
Scenario

27. Will is depressed and worried at the moment. He thinks that he has to quit chocolate forever.

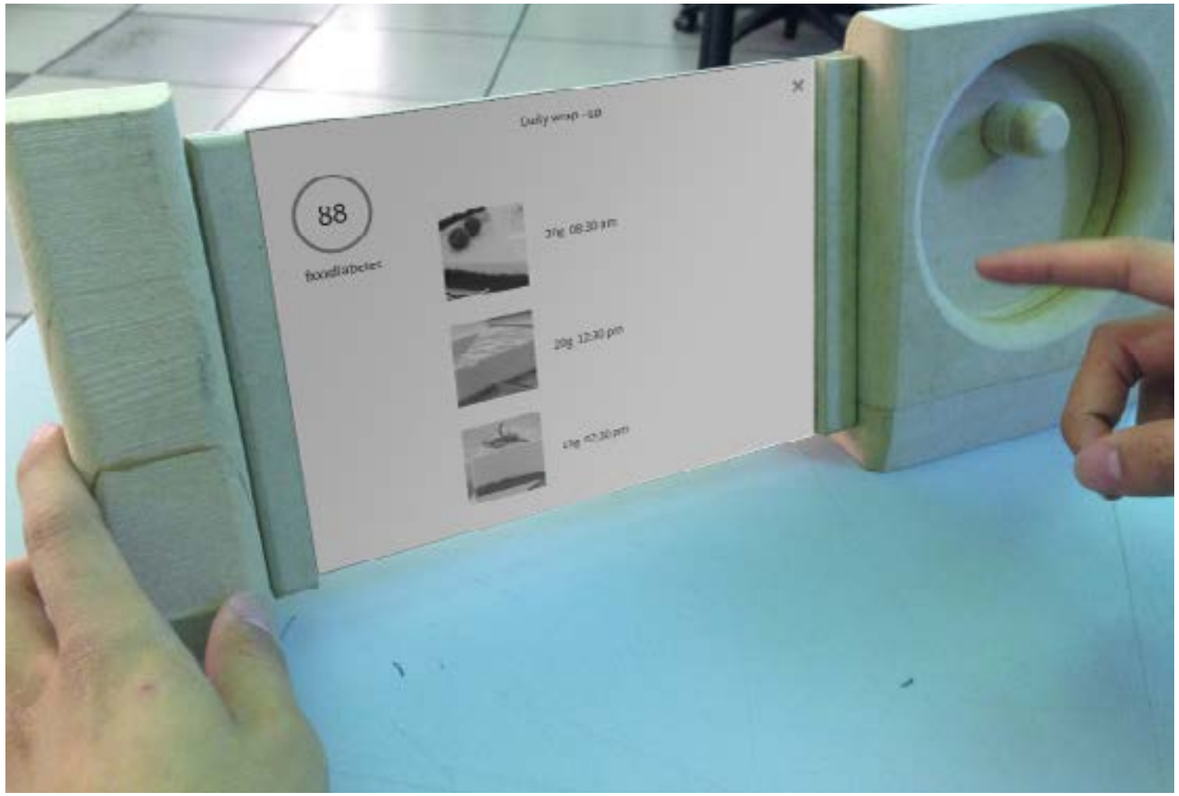


28. The coach then leads Will to the advice screen. Contrary to Will's belief, he doesn't have to quit chocolate. It's just that he needs to cut down the amount that he consumes at once.

Scenario

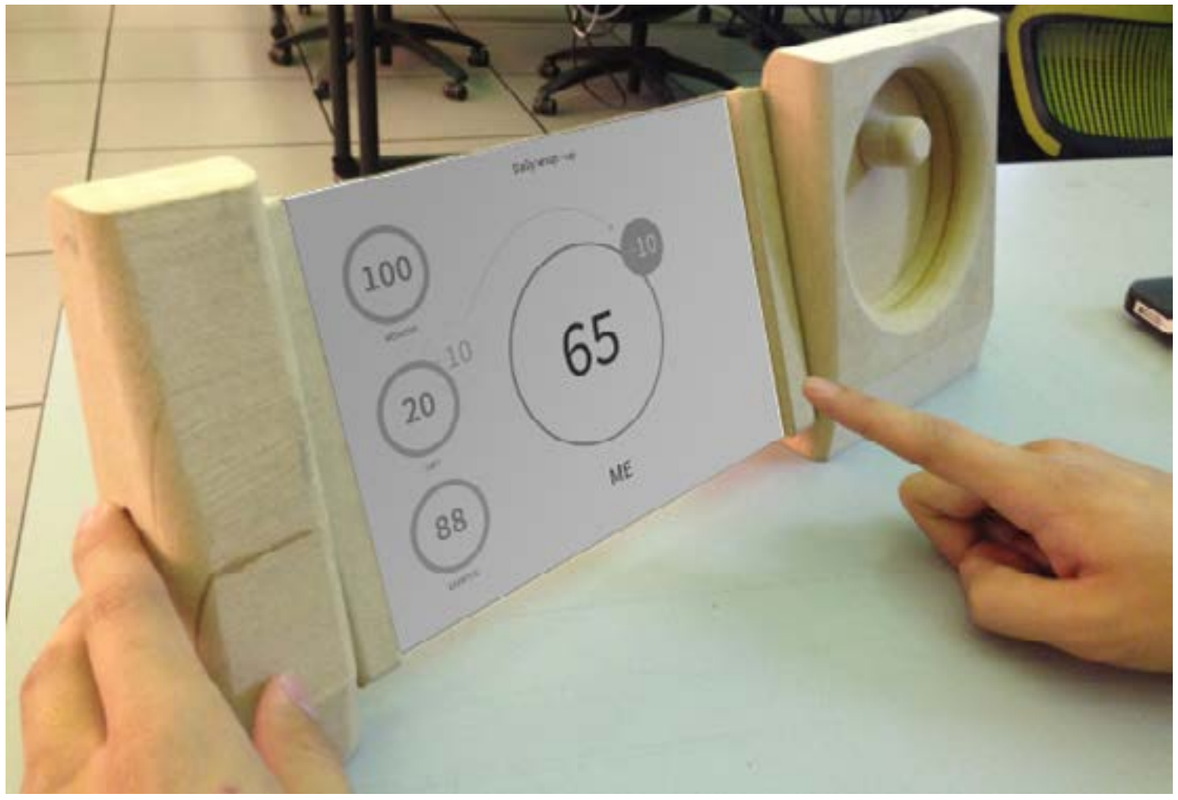


29. Will feels better now. The coach then recommends to check out the diet record of the score leader, 'fxxxdiabetes' of his lifestyle group.

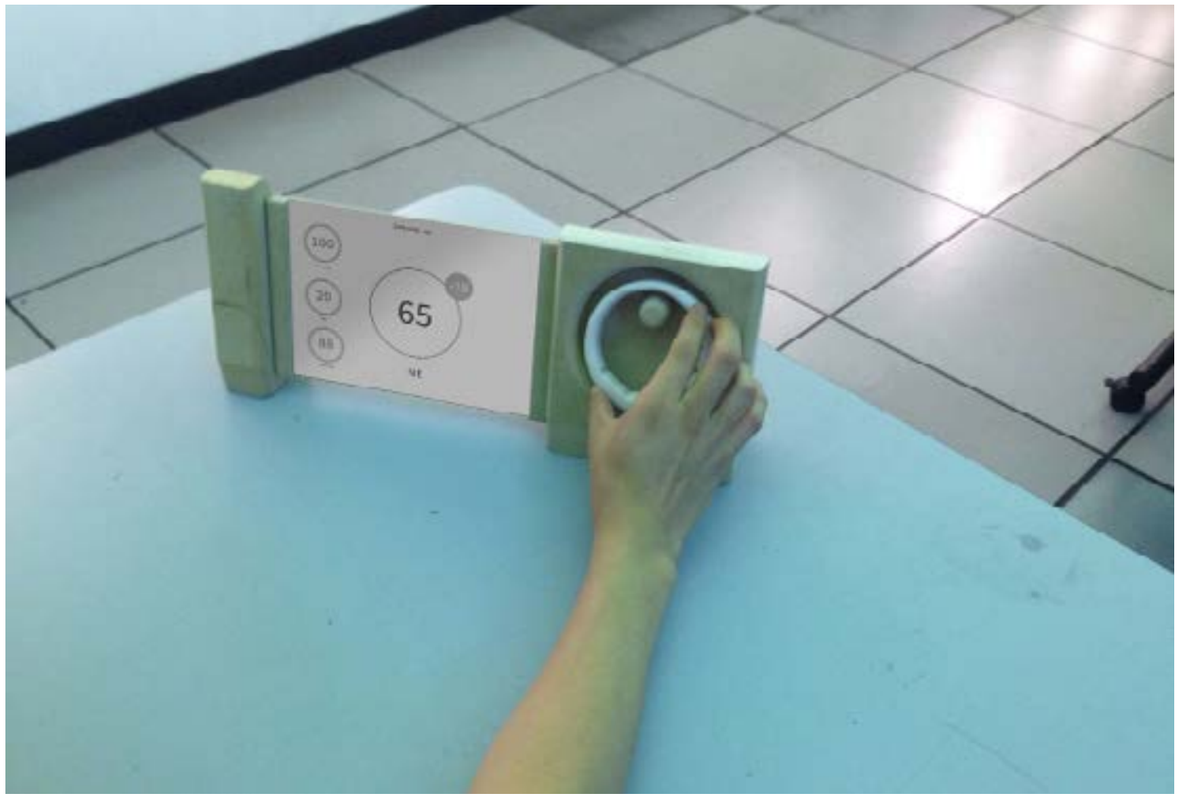


30. Will finds out that 'fxxxdiabetes' loves cheese cake. He also finds out that this user divides his consumption to three times a day. Will looks into the possibility of adapting that strategy.

Scenario



31. Will finished his daily wrap up, and gets 10 points for doing so. This brings his total score for the day to 65, and puts him in 4th place!



32. Will feels determined to keep track of his health and get better. He takes off his bracelet, and charges it for the next day. After a long and exhausting day, Will goes to sleep.

Scenario

37. After a great lunch, he goes into Dr. Claudia's office. Dr. Claudia already knows that Will is adjusting successfully, by looking at the data accumulated from Will's devices.

38. Dr. Claudia is extremely happy and tells Will to keep up his fantastic work! She also tells Will to stop by the nurse to either buy the device, or return it.

Scenario

39. Before Will leaves the hospital, he stops by the nurse and says he want to purchase his device. Will makes the payment, and is on his way to becoming a better diabetic patient, and a role model to patients recently diagnosed with diabetes.

Scenario

Three Months Later...

Scenario

33. It’s been three months since Will has been diagnosed as diabetes. He has an appointment with Dr. Claudia in the afternoon.

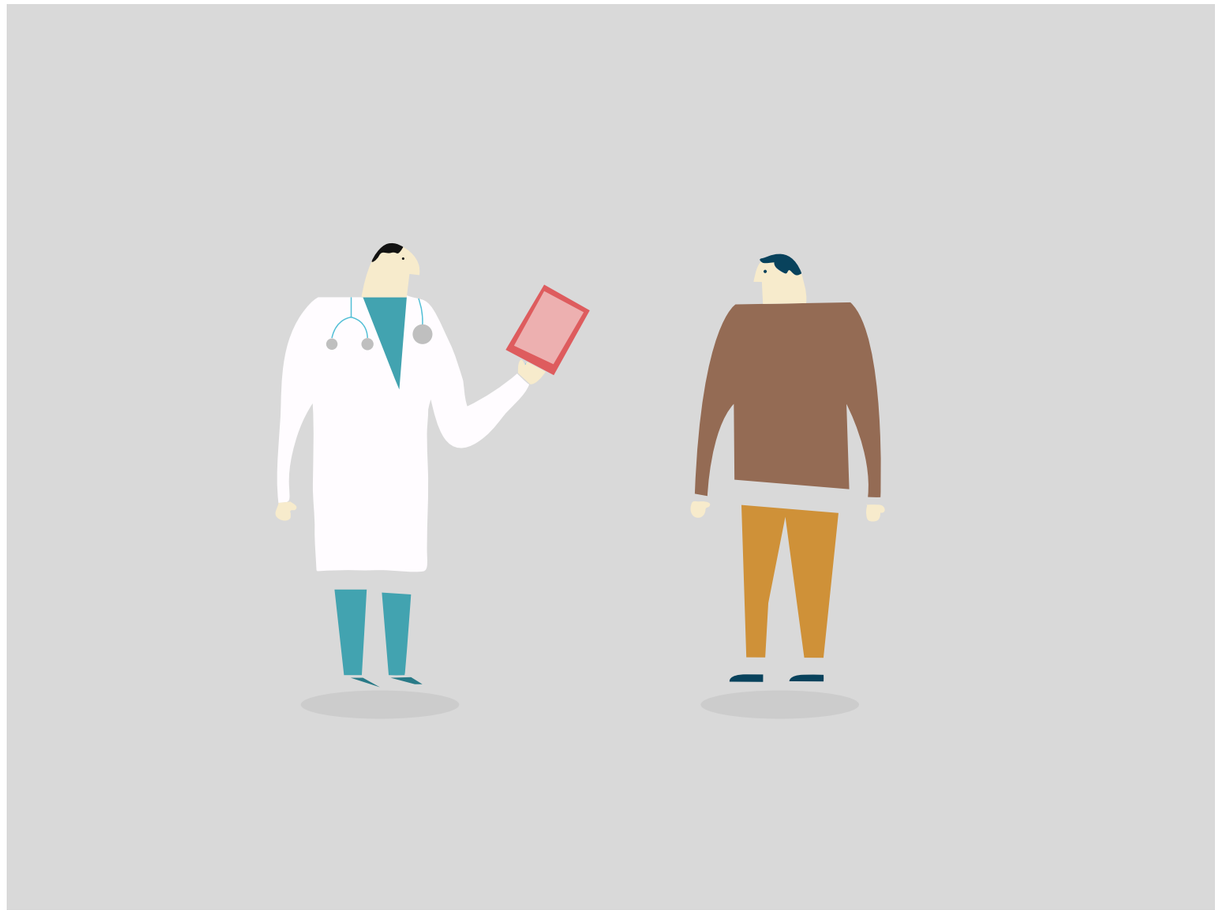
34. He collected 6 crowns in his lifestyle adjustment group throughout three months. Now other patients are looking up how he manages his lifestyle so well.

Scenario

35. Will heads out and goes out for a lunch before he meets Dr. Claudia. He goes in the restaurant, and sees what is recommended.

36. Since he's been managing his diet so well, there are a lot more options for him to choose from. He chooses the sirloin steak.

Reference

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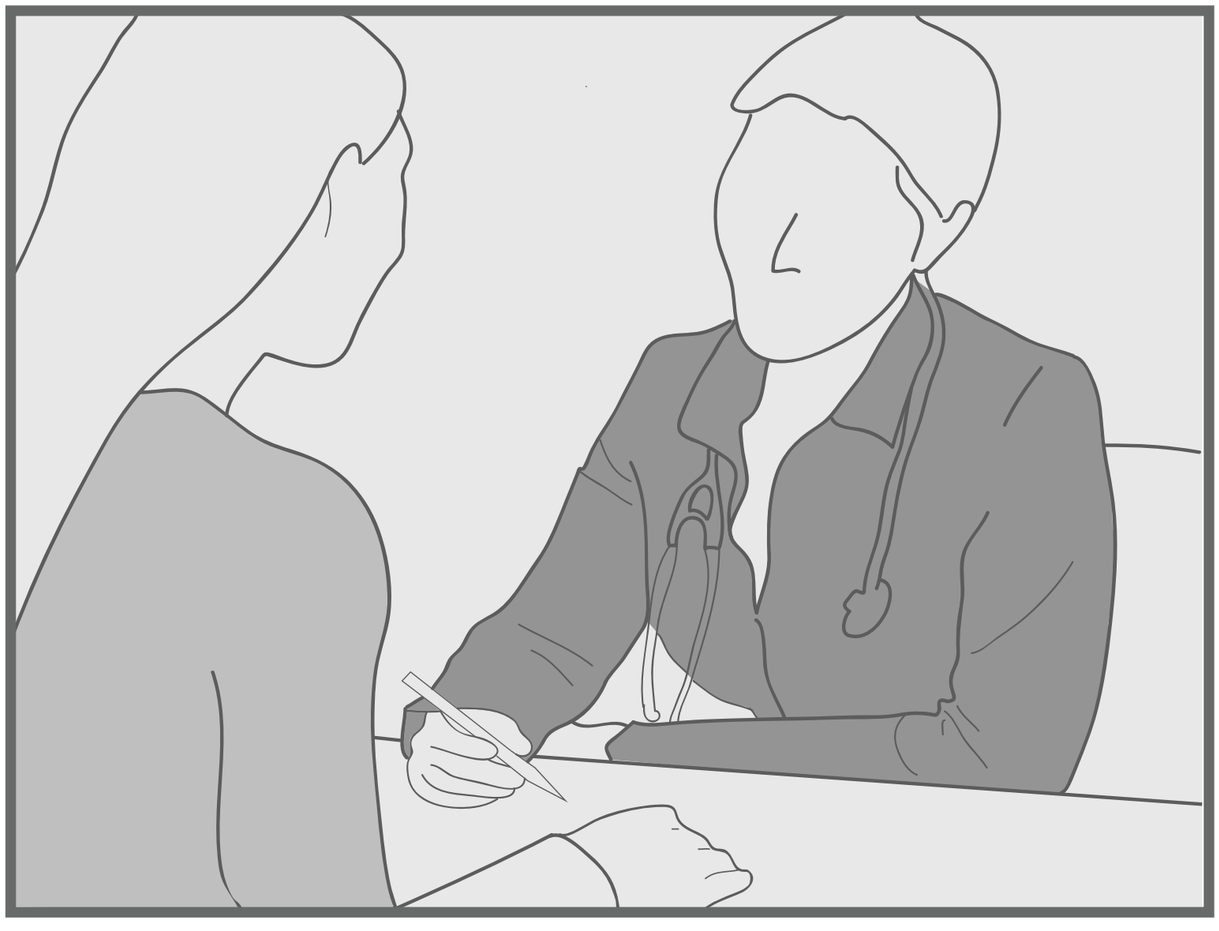
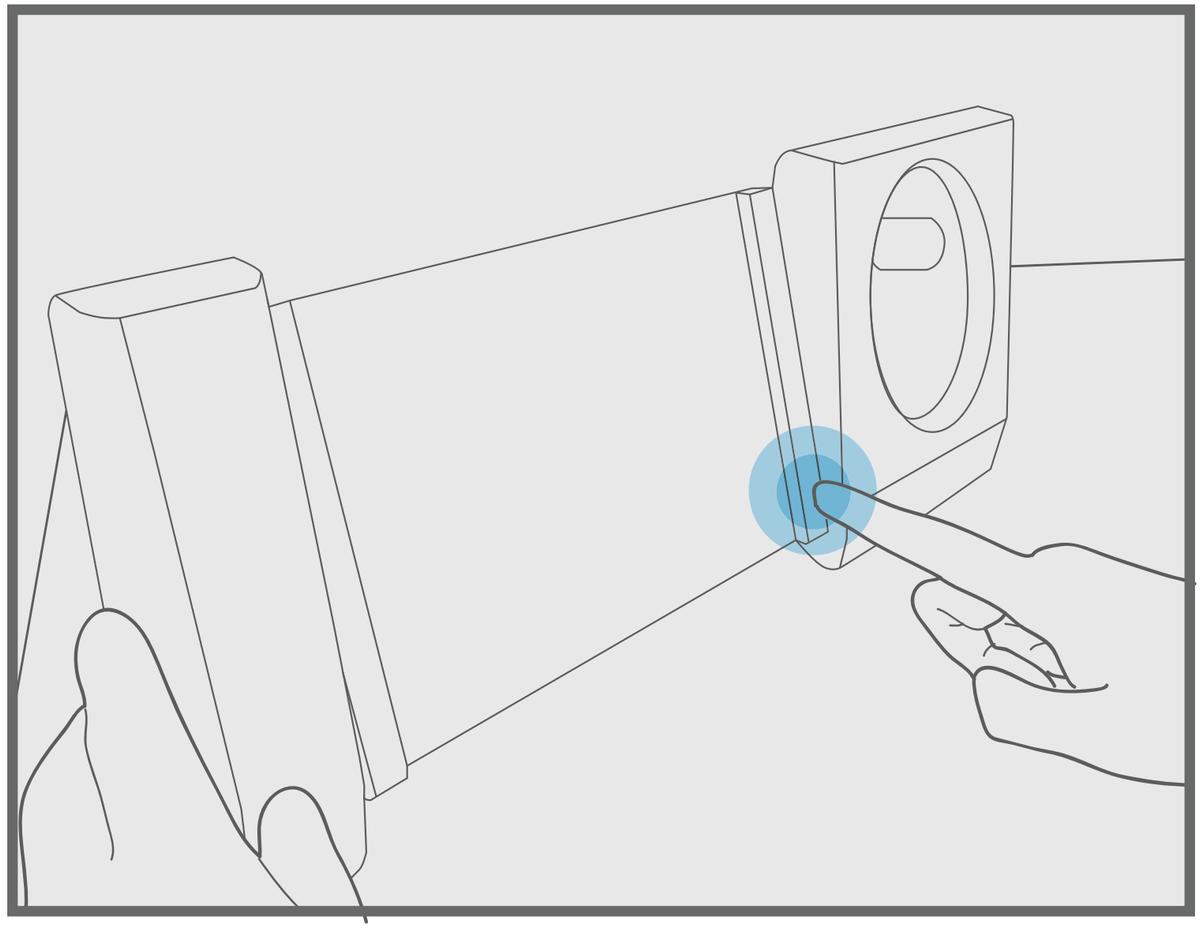
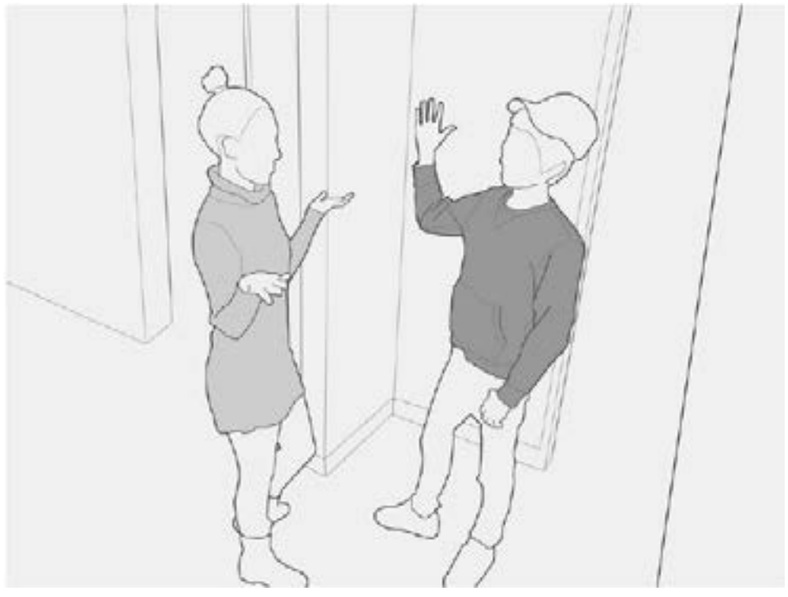
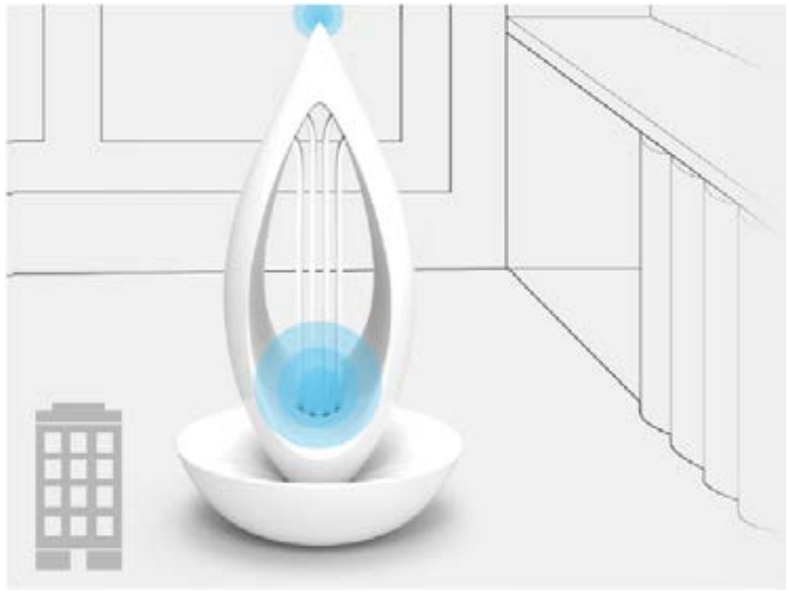
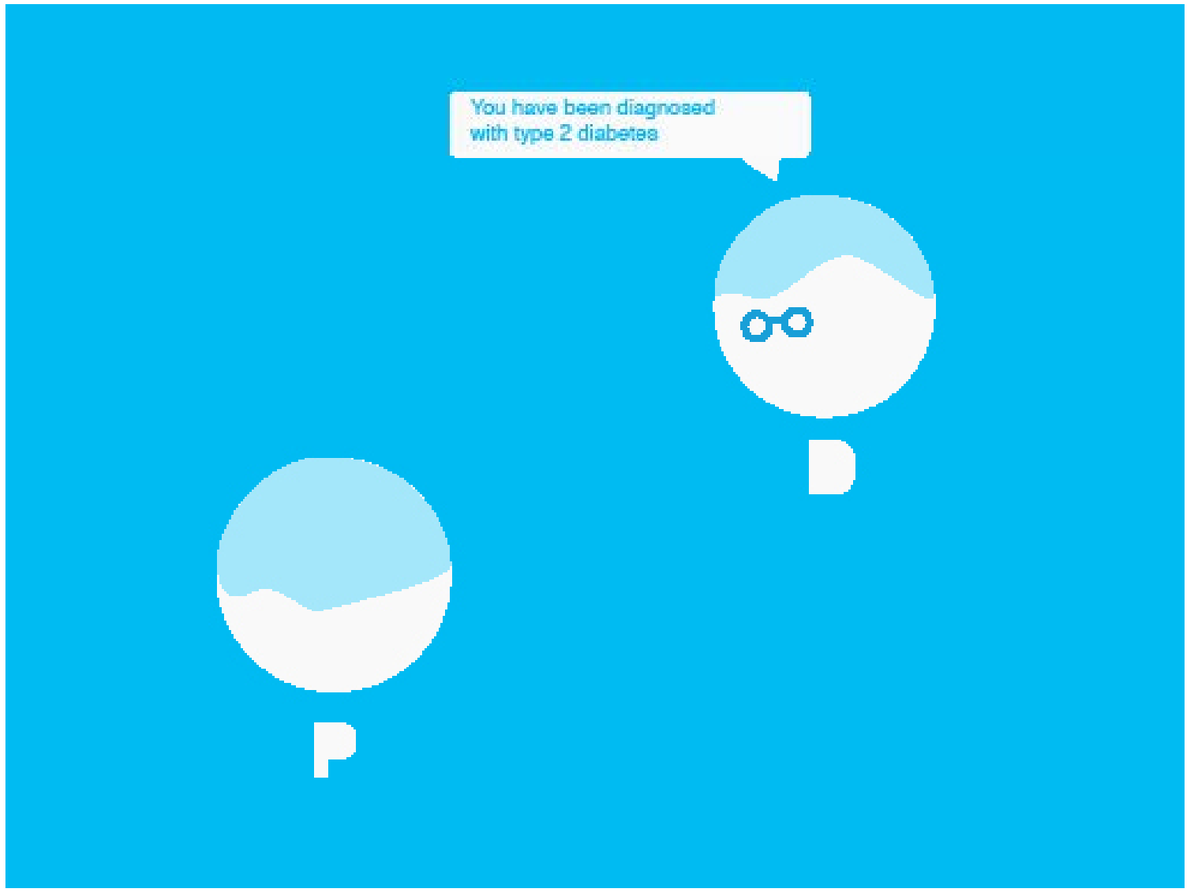
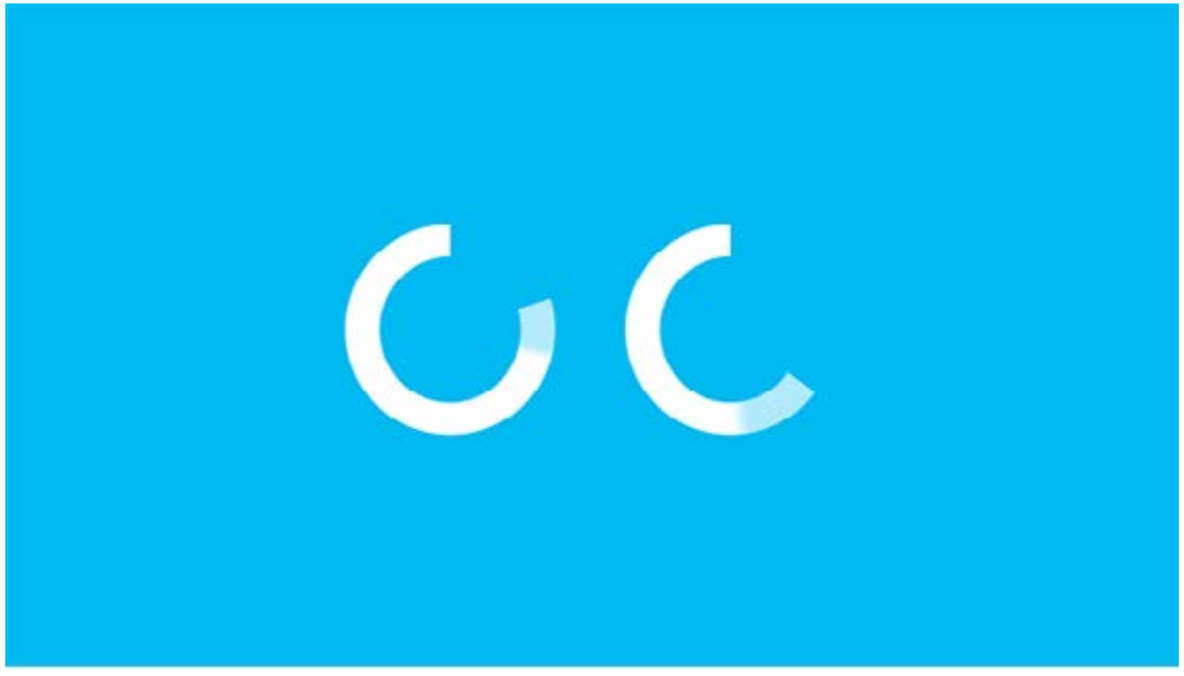








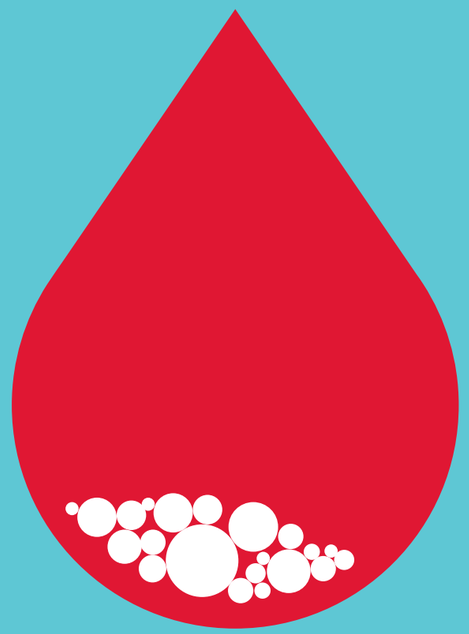

You have been diagnosed
with type 2 diabetes



Mastercopies

ATT 9:25 P M 100%

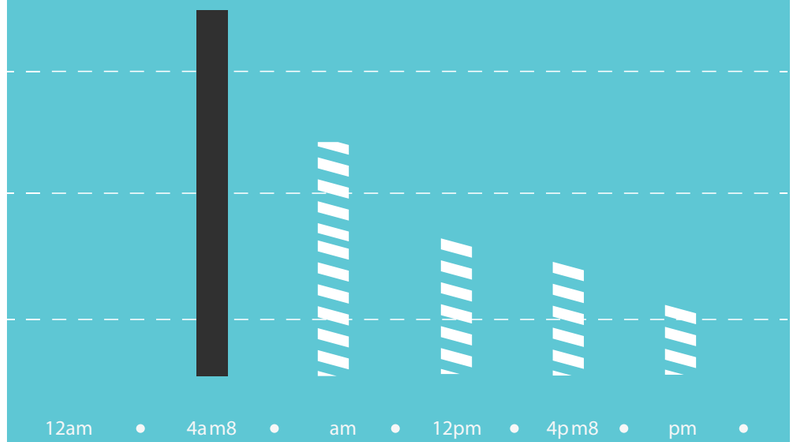
OVER ALL



ATT 9:25 P M 100%

GLUCOS E

183
mg/dL



ATT 9:25 P M 100%

PRESCRIPTION

MEDICINE

Meft rmin 500 mg

1 pill per day, after meal

8:00 PM

DIET

Limit your intake of fat

High b er food choices are encouraged

Reduce your sodium alcohol

EXERCISE

Control weight under 130 lbs

Walking over 3 miles

STYLE GUIDE

COLOR PALETTE:

TYPEFACE:

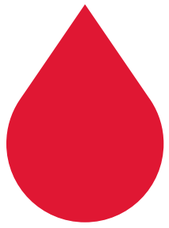
Apercu Bold

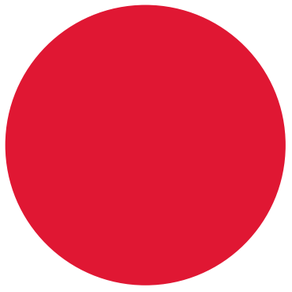
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Apercu Light

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ

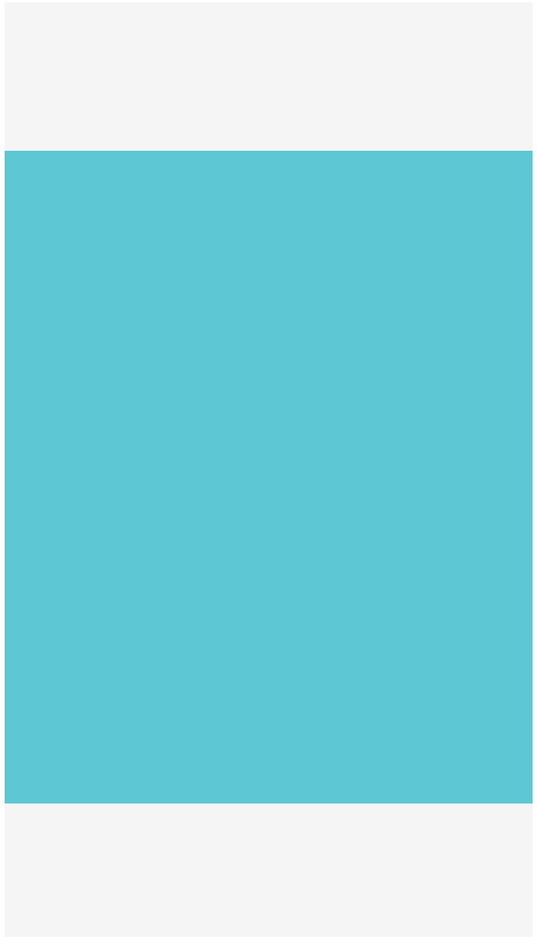
UI ELEMENTS:





UI ICONS:

LAYOUT:



Scenario

Scenario

01. Will is 35 years old. He plans to visit a local hospital to get a check-up, since he feels tired all the time, and work has been feeling very inefficient for him recently

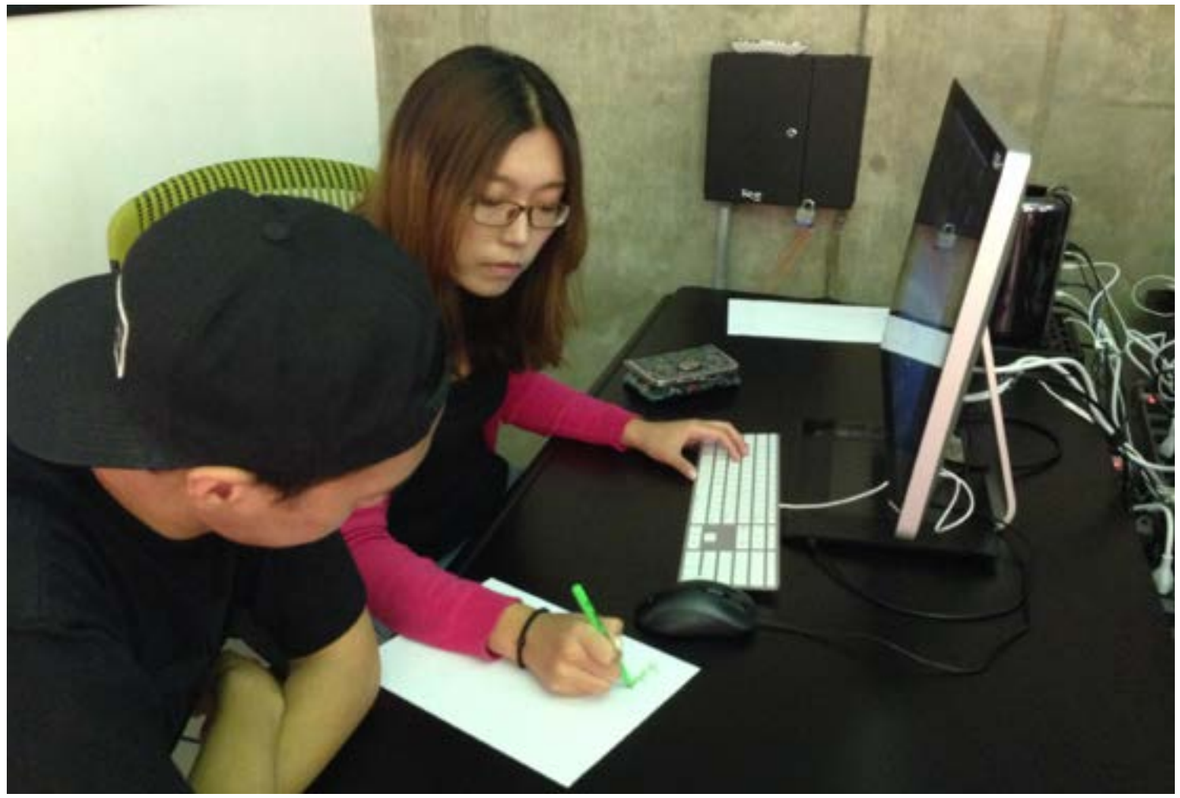
02. Will meets with Dr. Claudia, and she asks will to do a blood test and urine examination so that she has a better idea of what exactly is going on.

Scenario

03. Will comes back in a week, and meets with Dr. Claudia to understand whats going on. She delivers the bad news that Will has been diagnosed with type 2 diabetes. Wills face goes white

04. Dr. Claudia assures will that diabetes is not life threatening if death with appropriately. She explains the basics of diabetes and tells will that he will have to make changes to his lifestyle to cope up with the changes he will have to make in order to regulate the diabetes.

Scenario



05. Dr. Claudia prescribes Will with his medication and exercise from her computer suggests a device called ‘D-Coach’, which would help him to adjust to his new lifestyle. She ends the session by directing Will to the nurse’s desk.

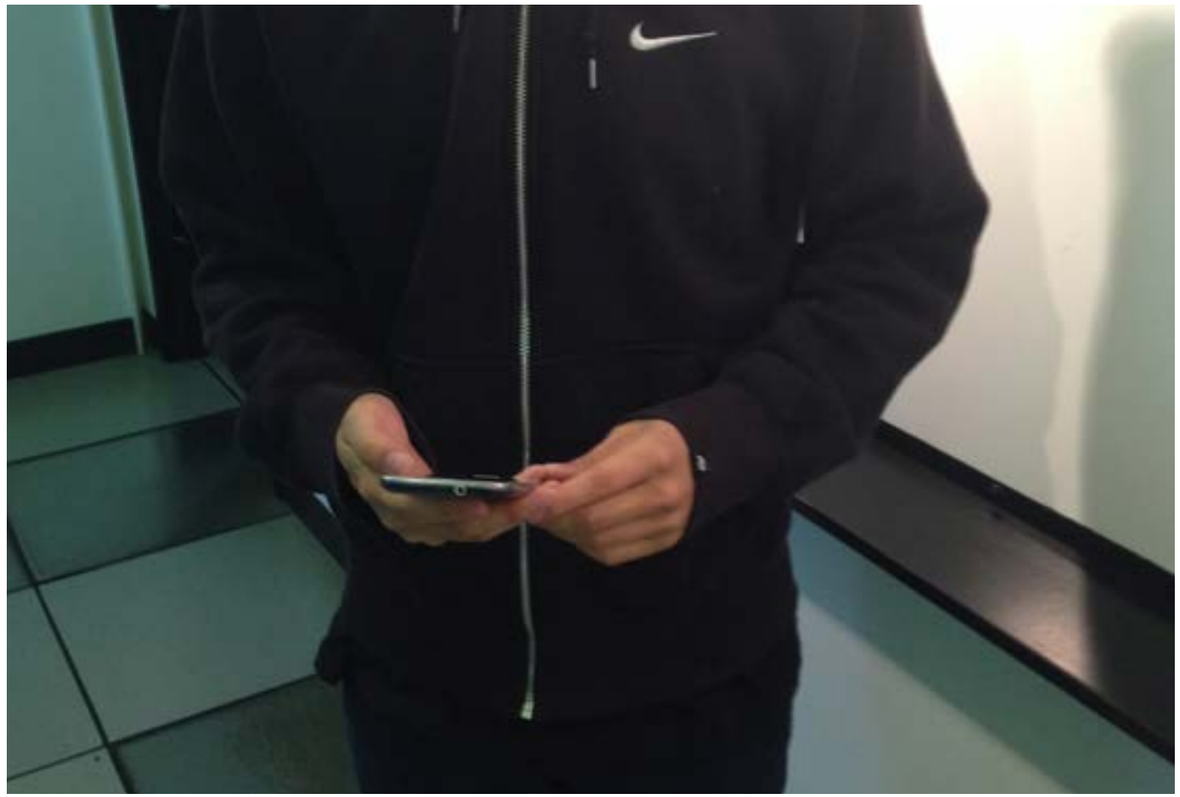
06. He visits the nurse and asks about ‘D-Coach’. The nurse explains how the device works, and how it will help him.

Scenario

07. The nurse instructs Will about the home device, mobile tracking device, and the application. He is now aware how each device work and how they are integrated.

08. Will decides to buy the device at $149, which is a price that is greatly reduced through subsidization from health insurance company.

Scenario

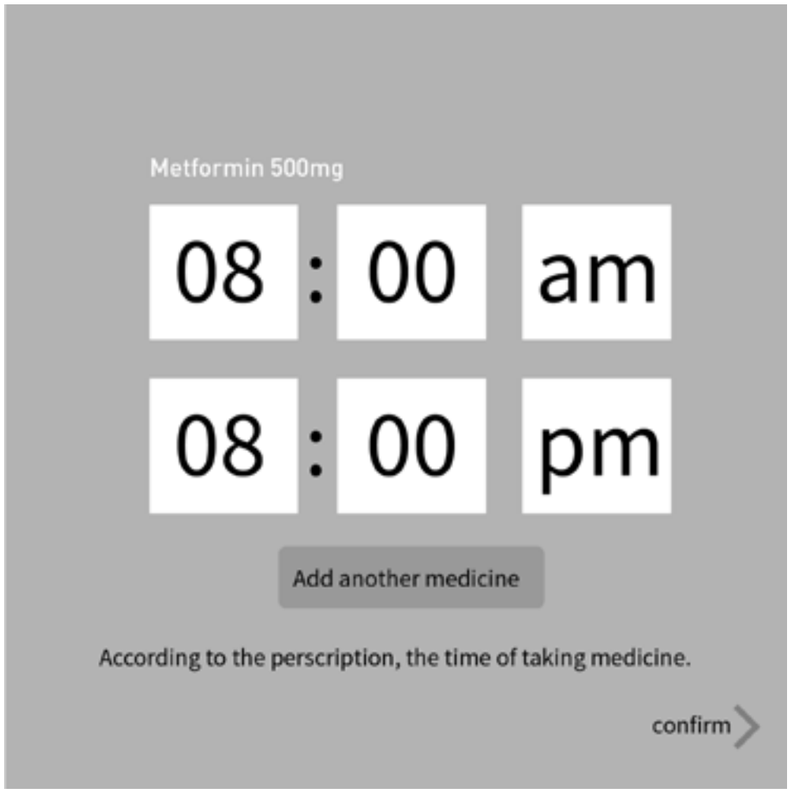


09. As a first step, Will downloads the 'D-Coach' mobile application, and connects his tracking device to his phone via Bluetooth

10. He goes to the nearby pharmacy, and shows the prescription of 500mg metformin on his cell phone application, which was prescribed by Dr. Claudia.

Scenario

11. Will then returns back home after an emotionally draining morning, but is eager to set the device up. He opens up the screen as ‘D-Coach’ welcomes him.



12. ‘D-Coach’ suggests Will to keep his medicine in the drawer of the device and set up an alarm that wil help him to take his medication on time.

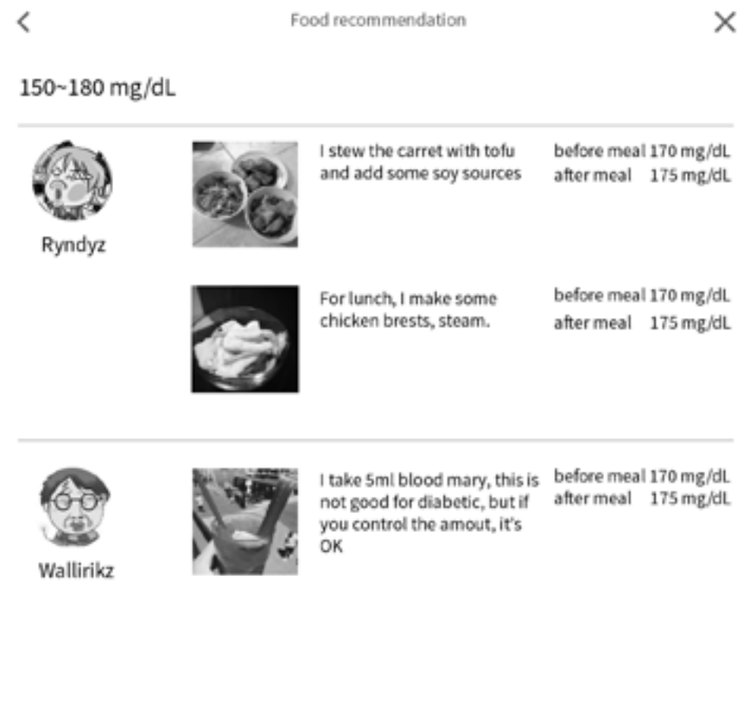
Scenario

13. The tutorial lets him know that the density of the balls displayed on the screen is the density of his current glucose level. He can lower them only by eating health, exercising, and taking medication.

14. After the tutorial is done, Will is lead to the main screen, and he starts exploring the device.

Scenario

15. As Will is browsing the interface, he stumbles upon the lifestyle transition group and decides to take part. He is brought to a quick info page that tells him that he will be connected with 5 anonymous individuals who he will compete against during his transition and adjustment to his new lifestyle. It displays the level of performance in 3 categories: medication, exercise, and glucose level, which is essentially diet.



16. He also finds out that you can connect to the lifestyle community, which has bunch of information on diet. It suggests cooking recipies and restaunt menu. He finds out that there is a same function in the mobile application, so he doesn't have to worry about what to eat wherever he is at.

Scenario

17. Will measures his glucose level. It's normal at 132mg/dL. The tracking is activated from now.

18. Will puts the tracker on its charger, and heads out of the room since he is hungry.

Scenario

19. He eats his favorite Reese's chocolate from his backpack. He has to head out to do some work for school because he can't concentrate working at home. He takes the tracking device with him.

20. Will decides to go to a coffee shop and get an iced americano, which is recommended by the lifestyle community. He already decided to go to Harmony Farm restaurant for dinner after he is done working.

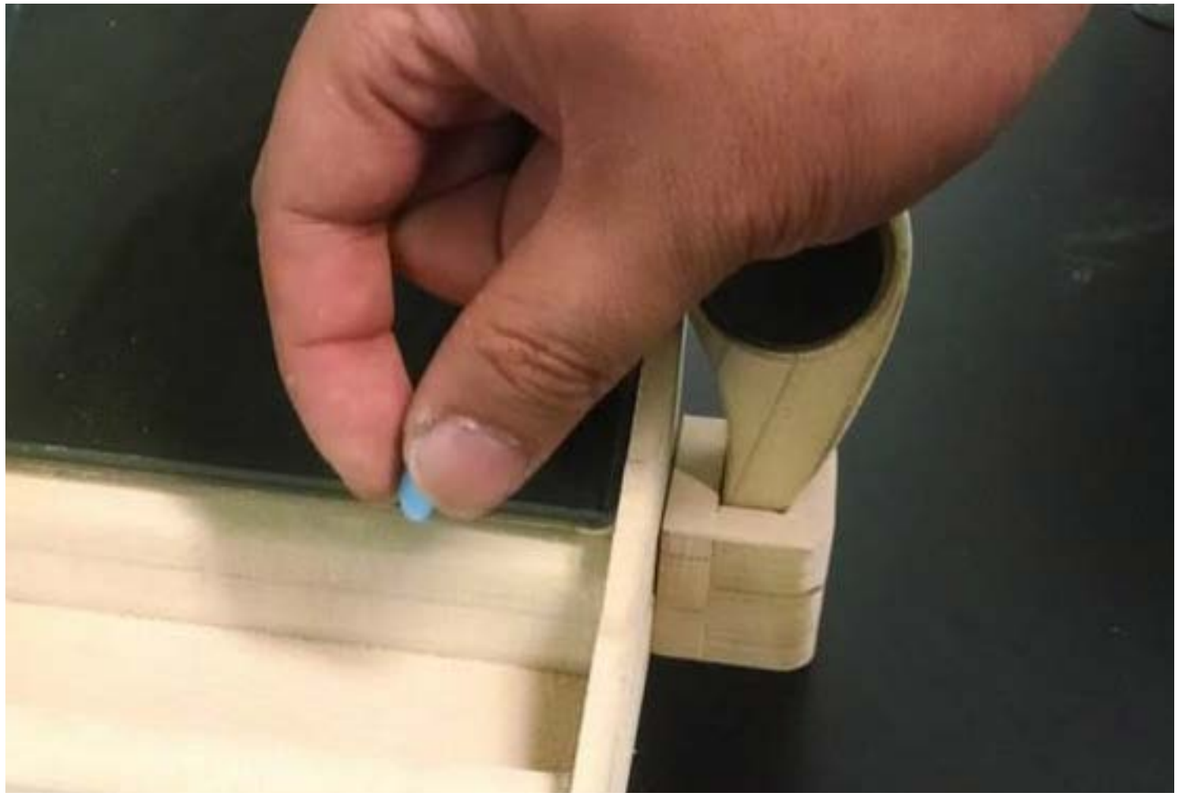
Scenario

21. Will heads to the Harmony Restaurant around 6:00p.m. He measures his glucose level with the tracker as instructed to measure it before every meal.

22. This time, the reading is 183mg/dL! He can't believe it because he is feeling fine. It must've been because of the chocolate that he had earlier.

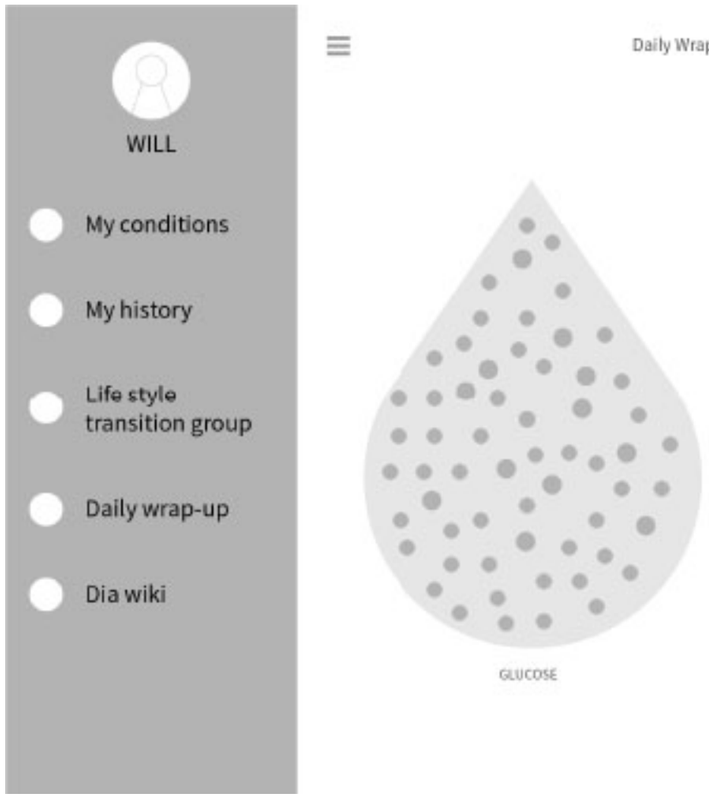
Scenario

23. Will was planning to get a tofu burrito, but he has no option, but to choose garden salad.



24. Will is now back home. He takes his pill, which is scheduled at 8:00 p.m.

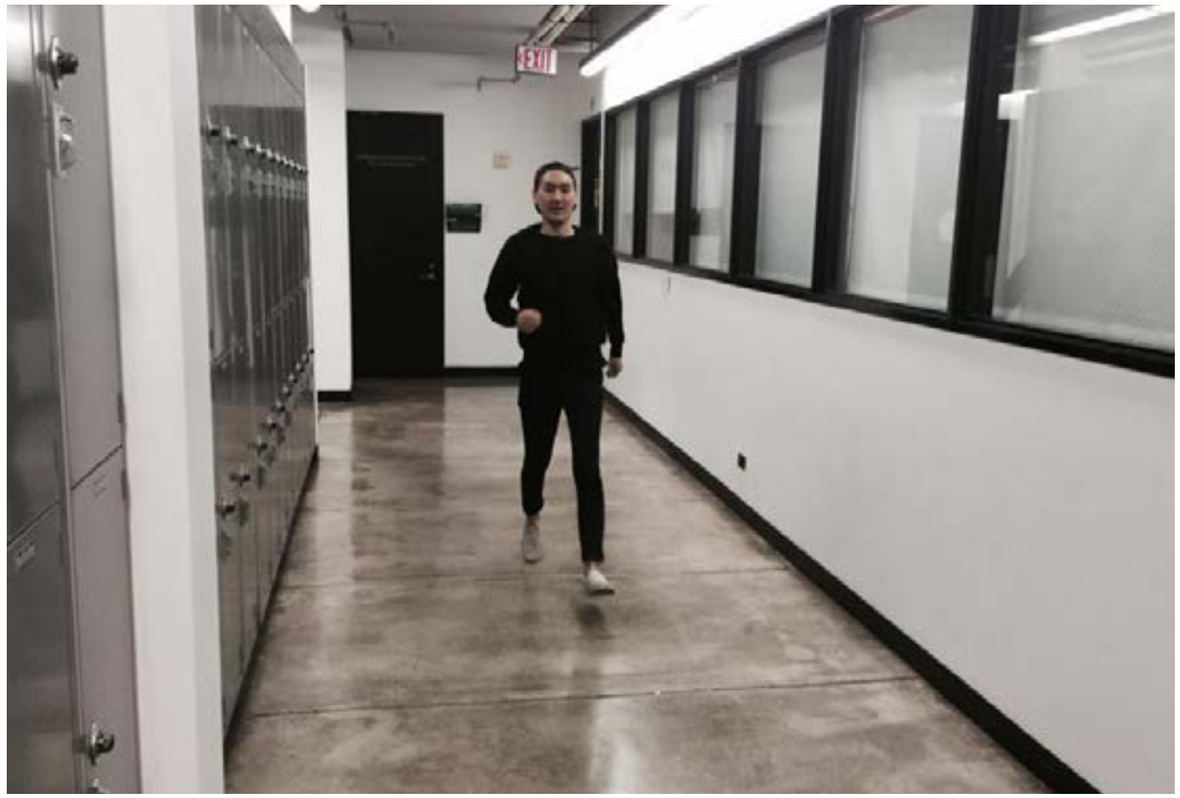
Scenario



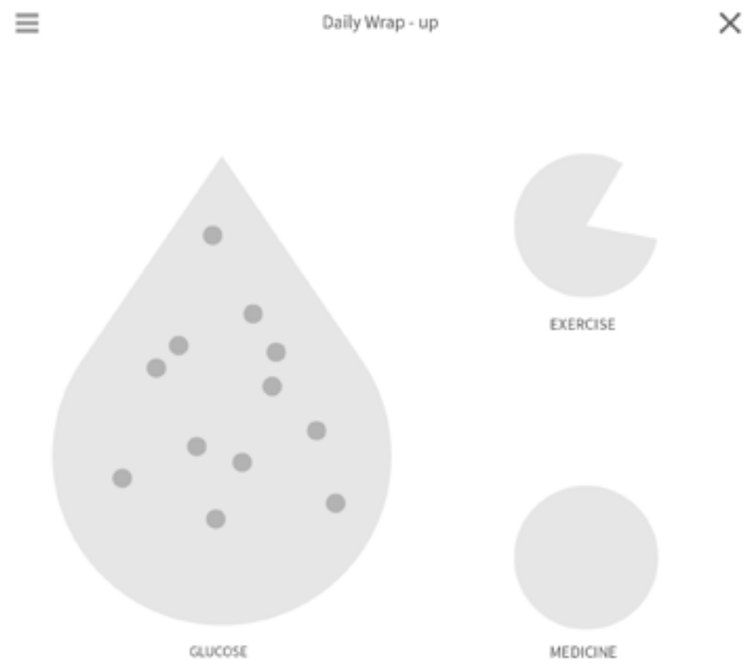
25. He naturally looks at the default screen, and finds out that his glucose density is very very high. Will is freaking out!

26. He looks up what he can do to lower the density. He can do some more exercise.

Scenario

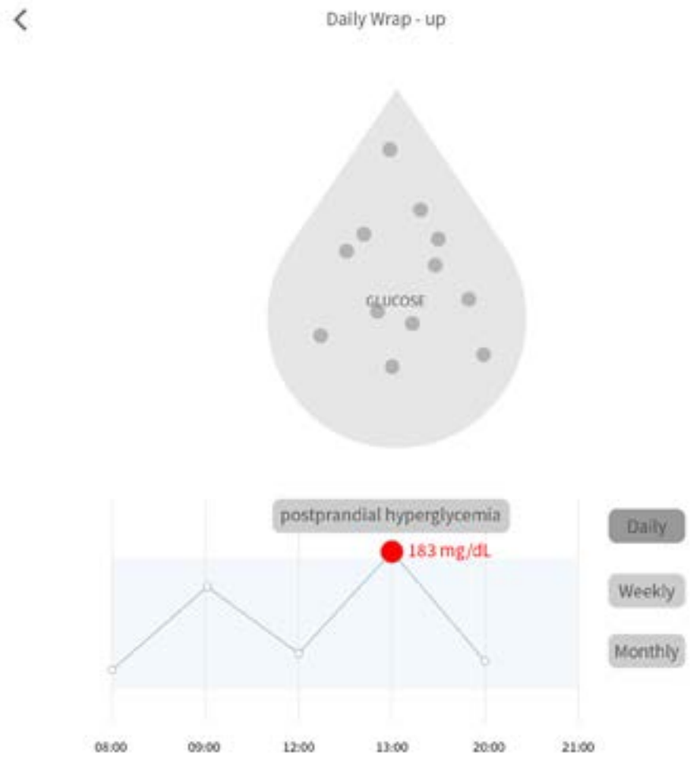


27. Will decides to run for an hour. However, he is burnt out after 30 minutes since he haven't done exercise regularly.

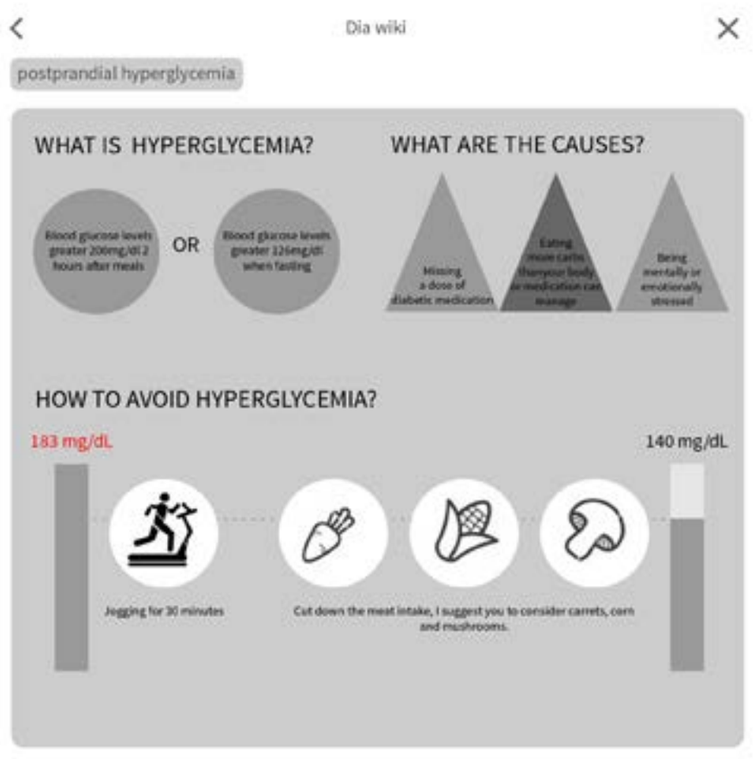


28 The glucose level has gone down a bit, but he has a lot to clean up in his blood stream.

Scenario



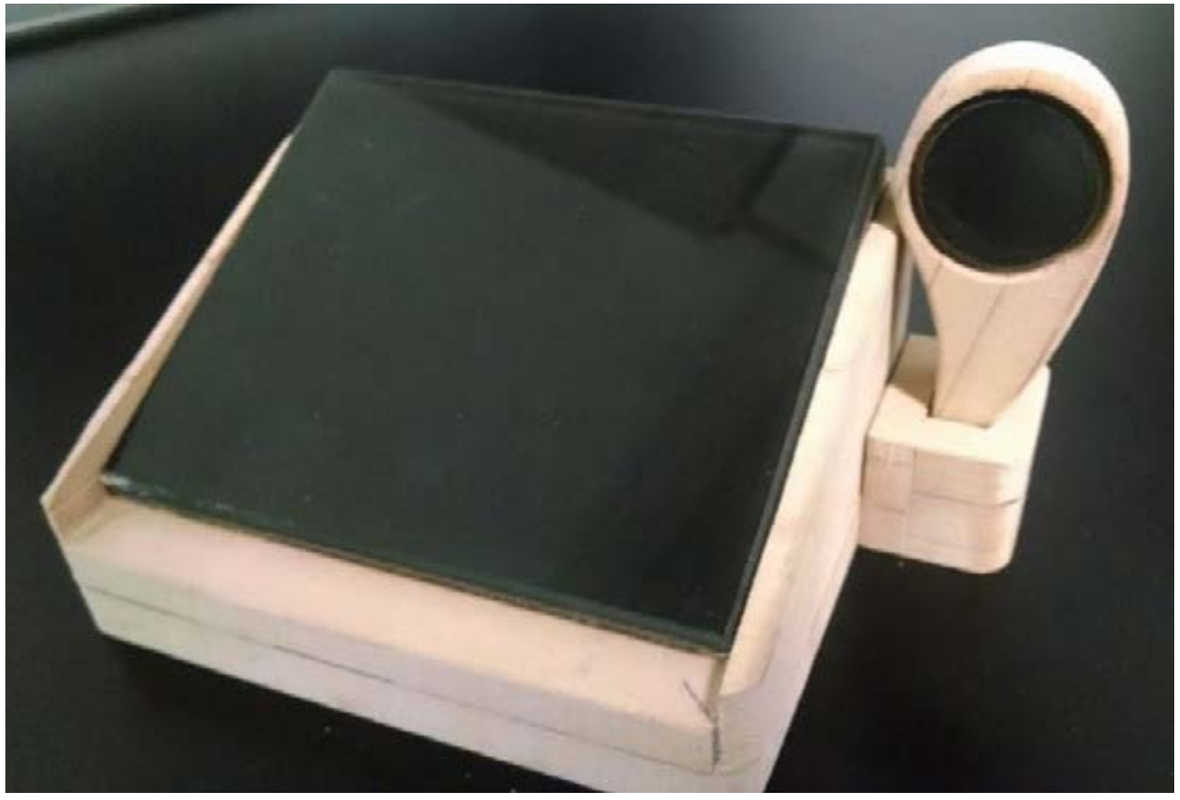
29. Will is navigating through his record throughout the day. He finds out that the high glucose level state that he was at is called hyperglycemia.



30. Will is unfamiliar with the term. He presses the hyperlinked word, and is lead to an info screen about hyperglycemia, and how to prevent it.

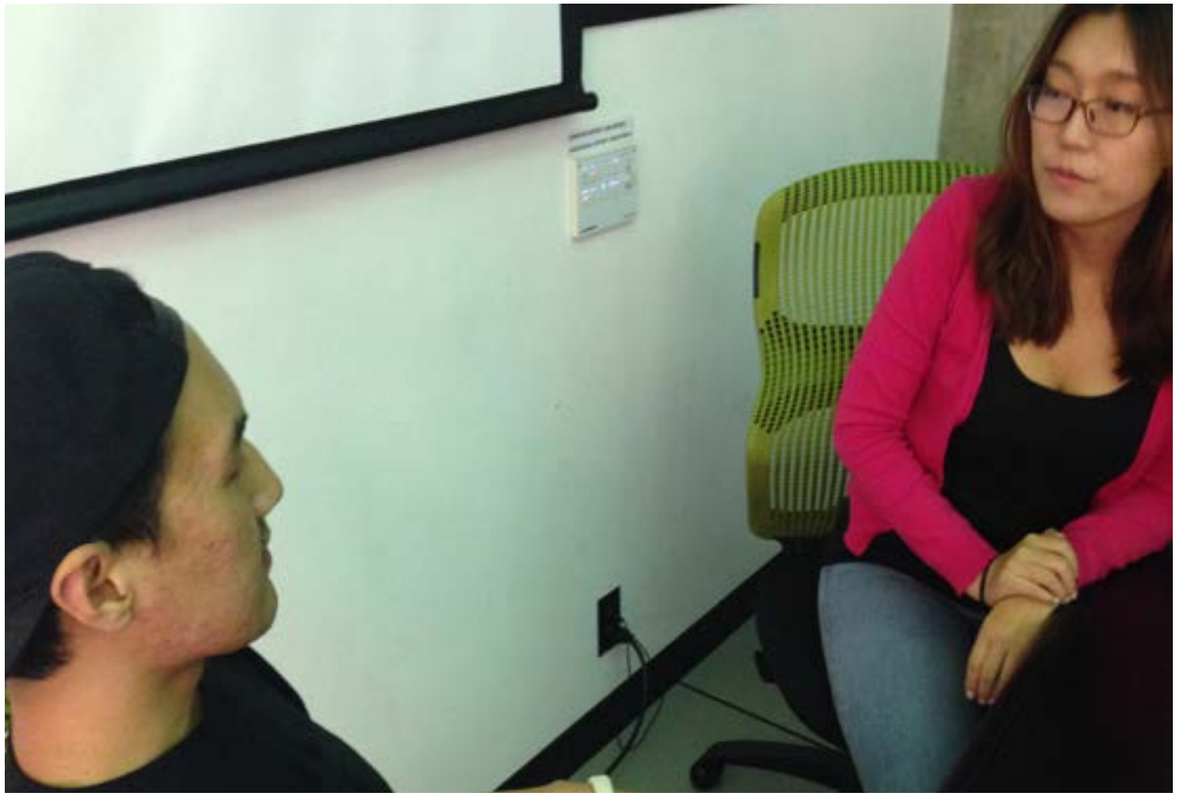
Scenario

31. Lastly, Will checks on how other people are doing in his lifestyle group compared to him. He is eager to step up and do as well as other people, especially, in managing the glucose level.



32. Will closes the device and goes to sleep, hoping for better tomorrow.

Scenario



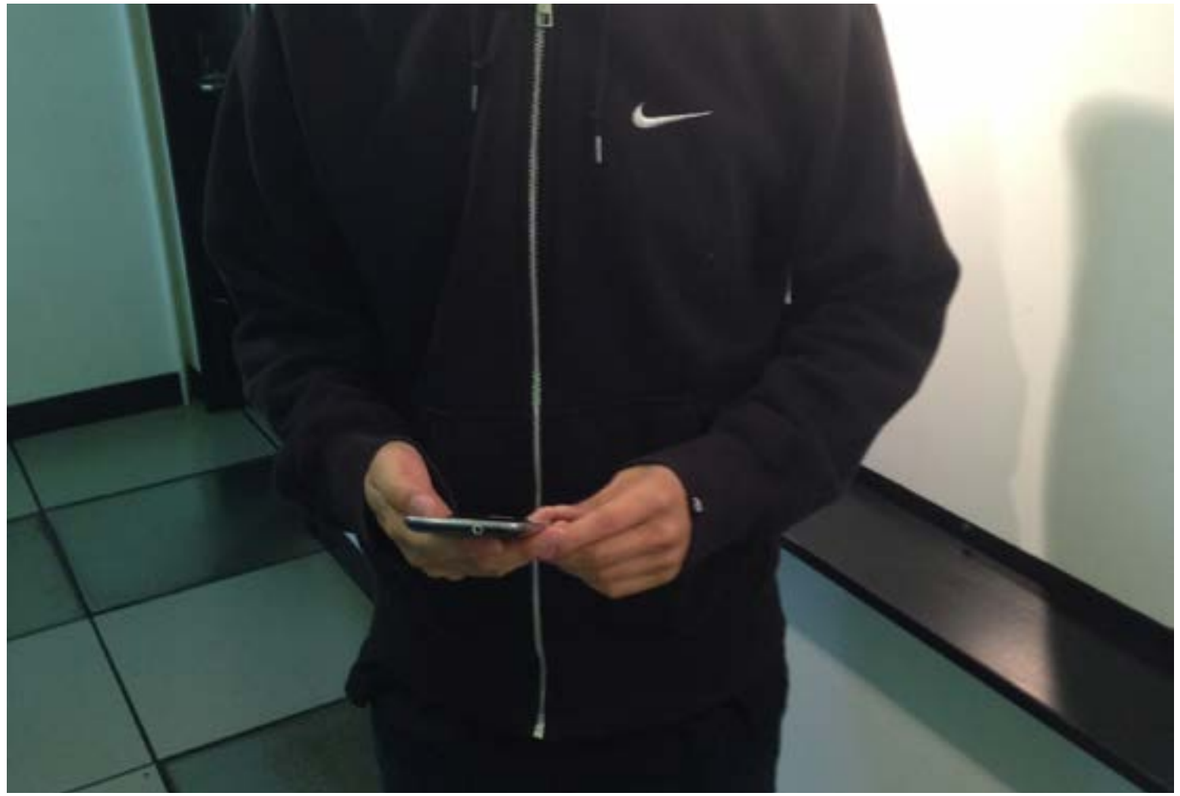
37. After a great lunch, he goes into Dr. Claudia's office. Dr. Claudia already knows that Will is adjusting successfully, by looking at the data accumulated from Will's devices.

38. Dr. Claudia is extremely happy and tells Will to keep up his fantastic work! She also tells Will to stop by the nurse to either buy the device, or return it.

Scenario

Three Months Later...

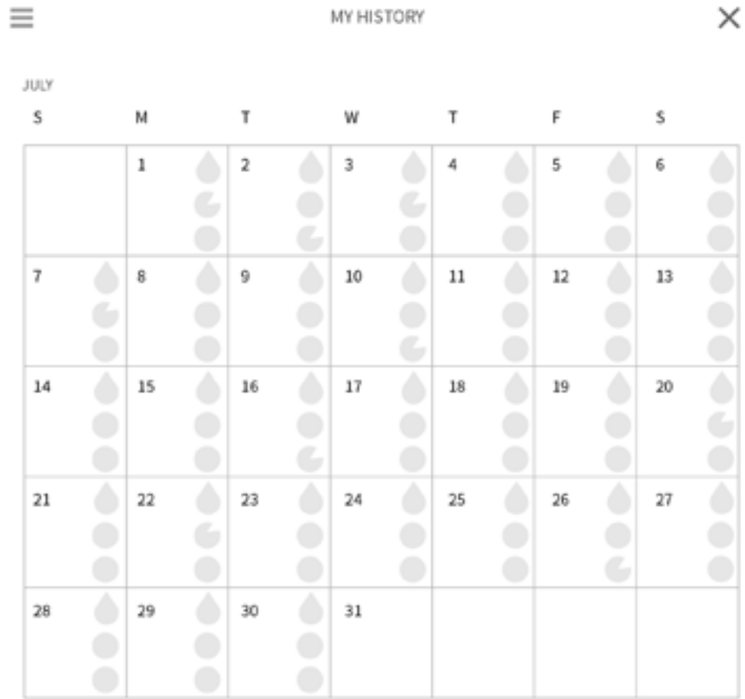
Scenario



33. It's been three months since Will has been diagnosed as diabetes. He has an appointment with Dr. Claudia in the afternoon.

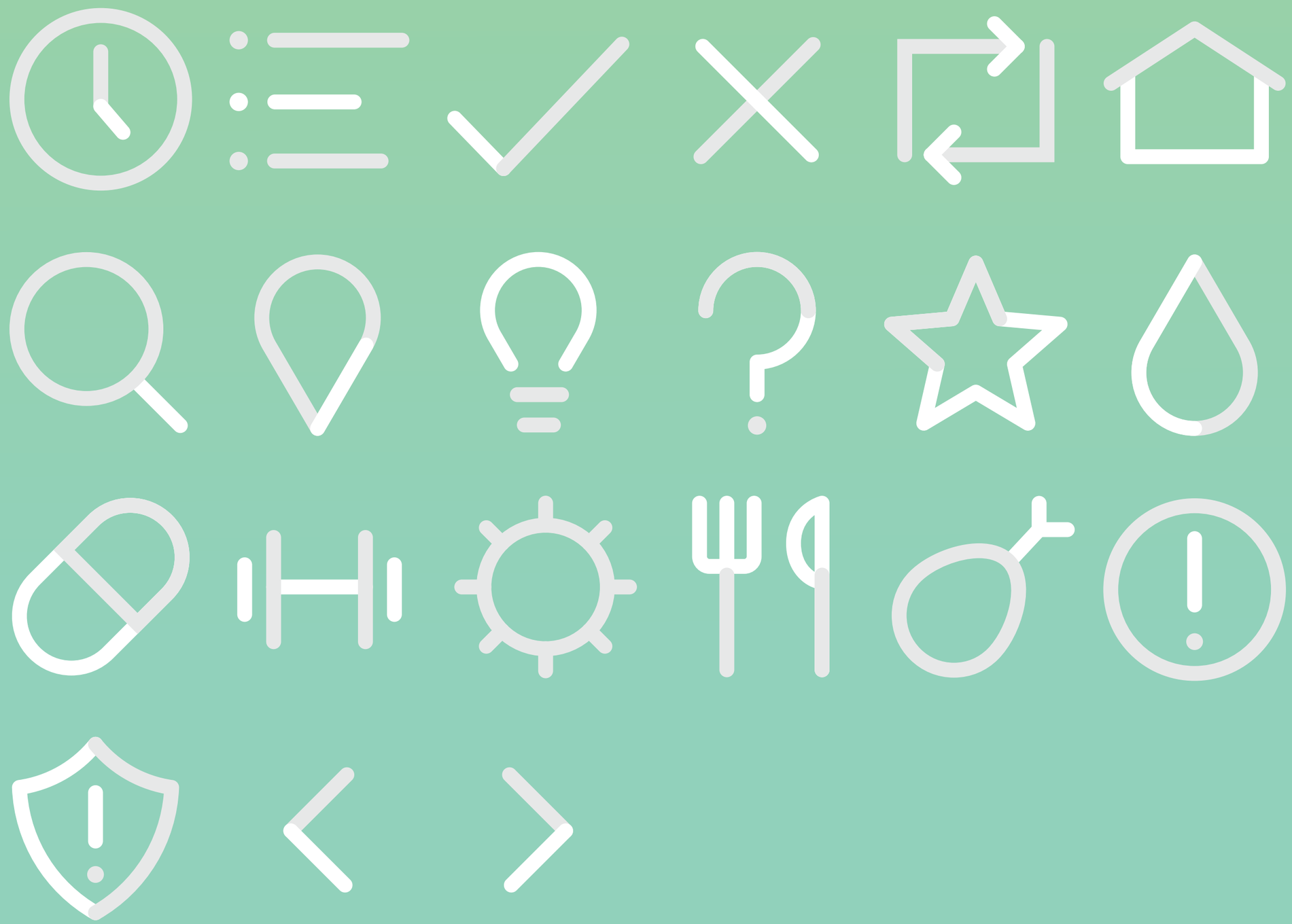
34. Today, Will starts off the day with no glucose on his screen. This is because he has managed himself well in terms of diet, medication, and exercise.

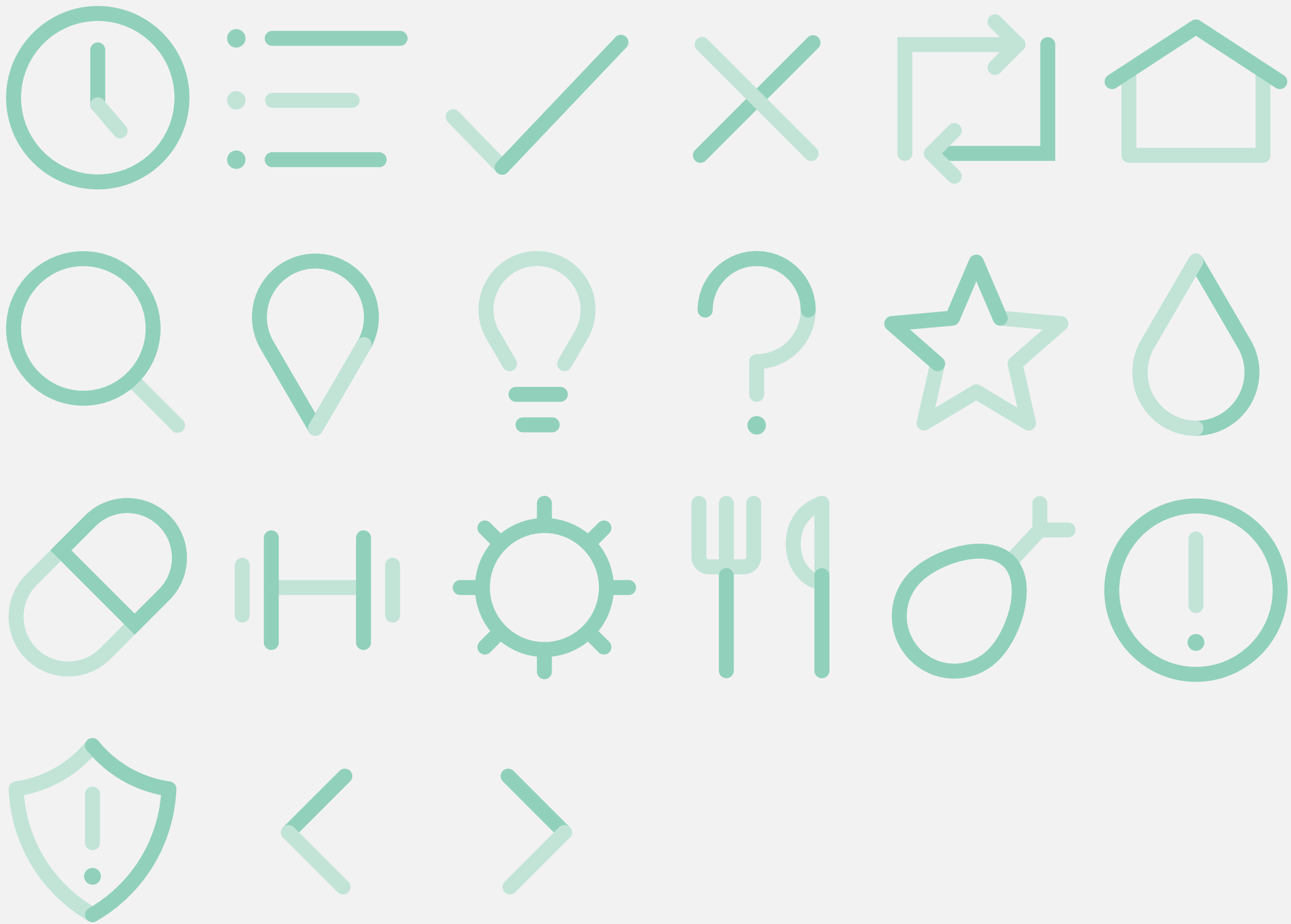
Scenario

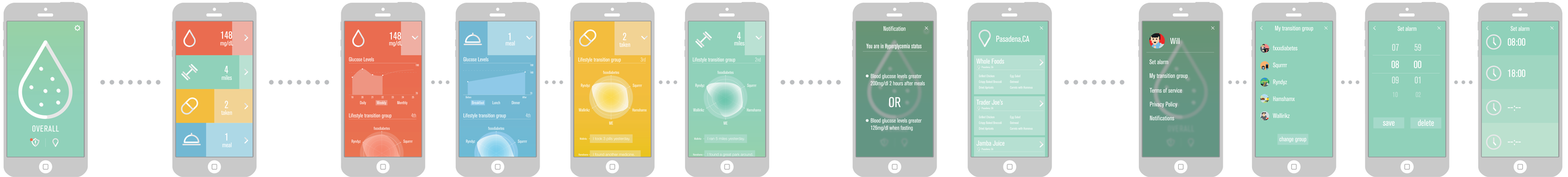


35. In fact, will has been doing very well for the past month!

36. Before meeting the doctor, Will goes to his favorite Harmony Farm restaurant to get his favorite Tofu Burrito.






OVERALL
148
mg/dL
4
miles
2
taken
1
meal
Glucose Levels
Daily
Weekly
Monthly
Lifestyle transition group
4th
foxxdiabetes
Ryndyz
Squrrr
Breakfast
Lunch
Dinner
Lifestyle transition group
3rd
Wallinkz
Hamshamx
ME
I took 3 pills yesterday.
I found another medicine.
Lifestyle transition group
2nd
I ran 6 miles yesterday.
I found a great park around.
Notification
You are in Hyperglycemia status
Blood glucose levels greater 200mg/dl 2 hours after meals
OR
Blood glucose levels greater 126mg/dl when fasting
Pasadena,CA
Whole Foods
Trader Joe's
Jamba Juice
Will
Set alarm
My transition group
Terms of service
Privacy Policy
Notifications
My transition group
change group
Set alarm
07
08
09
10
59
00
01
02
save
delete
08:00
18:00
--:--
--:--


OVERALL
148
mg/dl
4
miles
2
taken
1
meal
Glucose Levels
Daily
Weekly
Monthly
Lifestyle transition group
4th
foxxdiabetes
Ryndyz
Squrrr
1
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Breakfast
Lunch
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I took 3 pills yesterday
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Will
Set alarm
My transition group
Terms of service
Privacy Policy
Notifications
change group
Set alarm
07
08
09
10
59
00
01
02
save
delete
08:00
18:00
--:--


InVision
8:00 PM
100%
148
mg/dL
4
miles
2
taken
1
meal

DEAL

PEAL


PEAL

PEAL

PEAL

PEAL

System Diagram

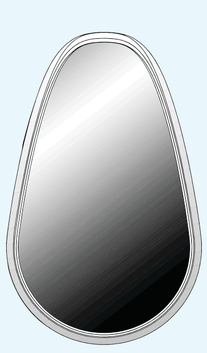
Dell Cloud Database

Accumulate Patient Information for Future References

Outdoors

Noninvasive Glucose Tracking

Portable
Discrete
Easy to Use

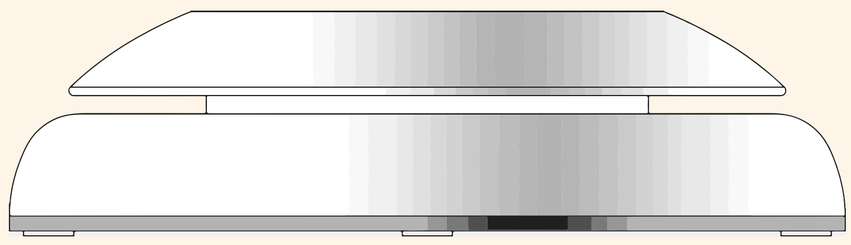


Mobile Application

Information Display:
Glucose, Exercise, Medication

Establish Connection:
Competition, Diet Recommendation

Alert:
Medication Time, Physical Anomalies



Daily Summary

Status Display Through Lighting Color (Red, Orange, White)
Trigger Motivation Through Purifying
Dock for Tracker

Dell Cloud Database

Accumulate Patient Information for Future References

DATA MANAGEMENT

Doctor’s Computer

Able to know more about the patient’s lifestyle through abundant, accurate information

OUTDOORS

Mobile Application

Information Display:
Glucose, Exercise, Medication

Establish Connection:
Competition, Diet Recommendation

Alert:
Medication Time, Physical Anomalies

Noninvasive Glucose Tracking

Portable
Discrete
Easy to Use

HOME

Daily Summary

Status Display Through Lighting Color (Red, Orange, White)
Trigger Motivation Through Purifying
Dock for Tracker

OVERALL

148
mg/dL

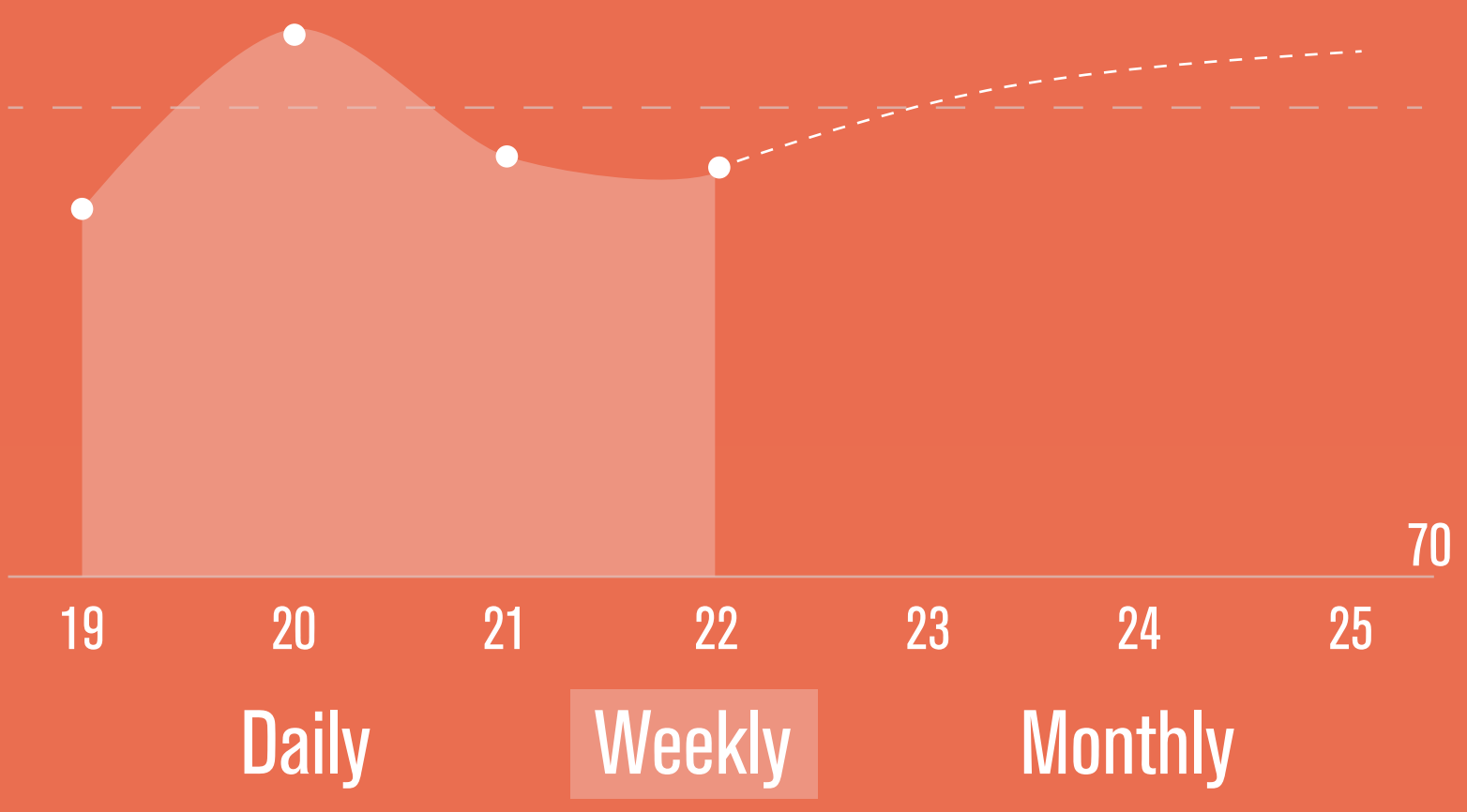
4
miles

2
taken

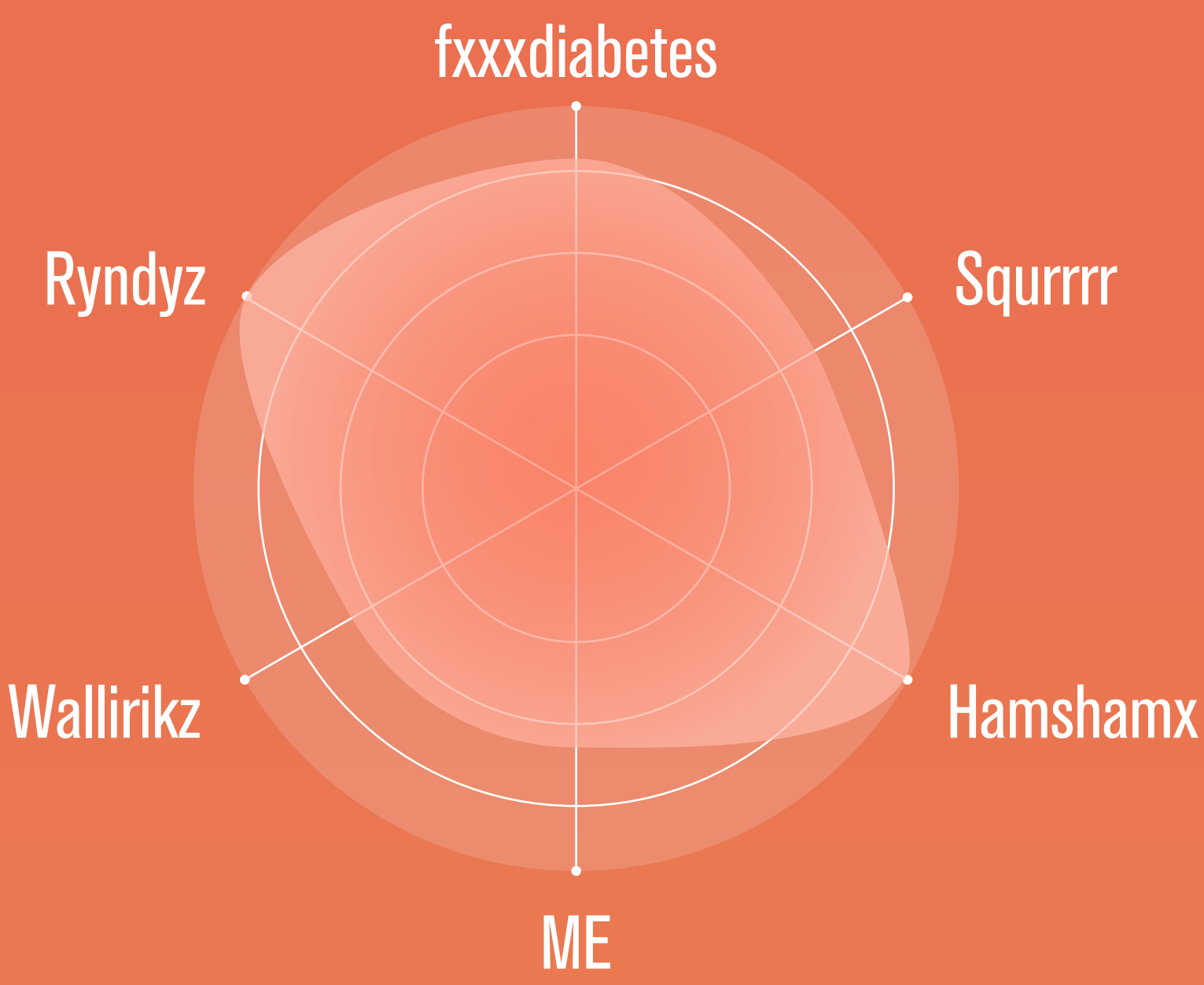
1
meal

148
mg/dL

Glucose Levels



Lifestyle transition group 4th

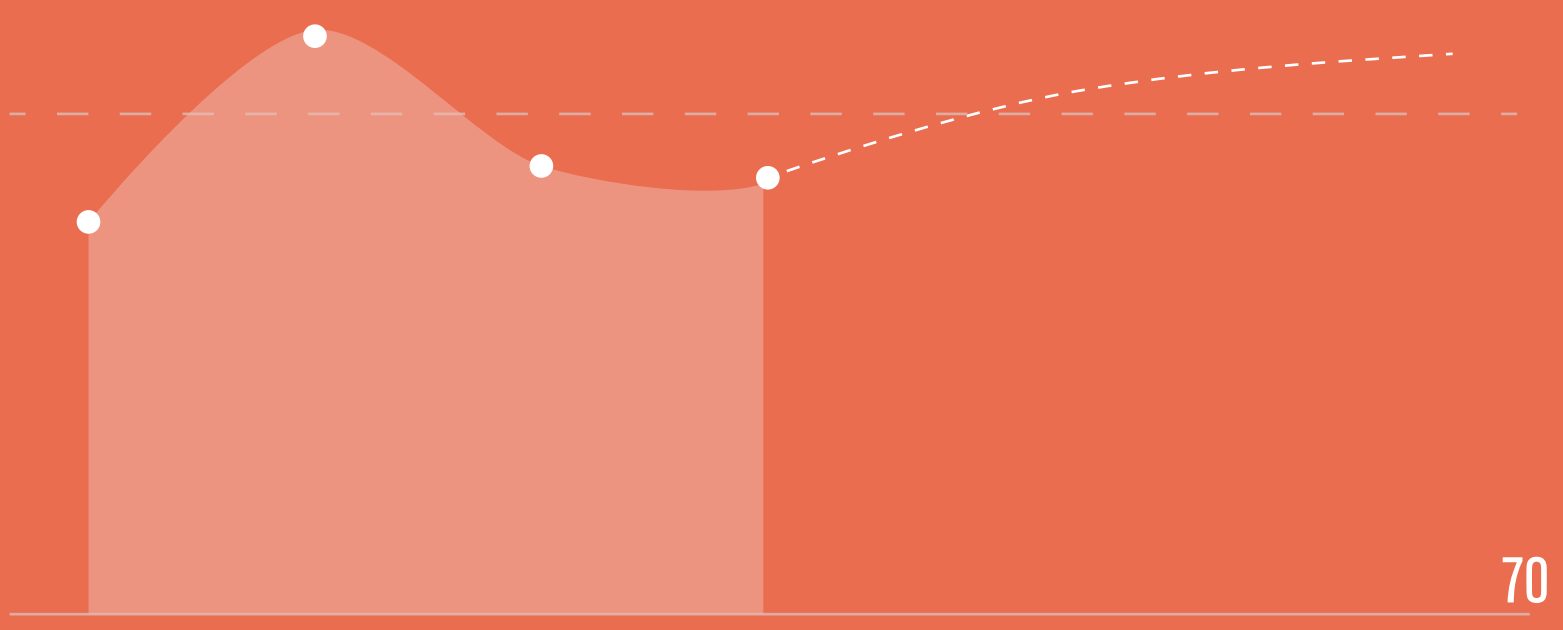


Wallirikz I ate chicken yesterday.

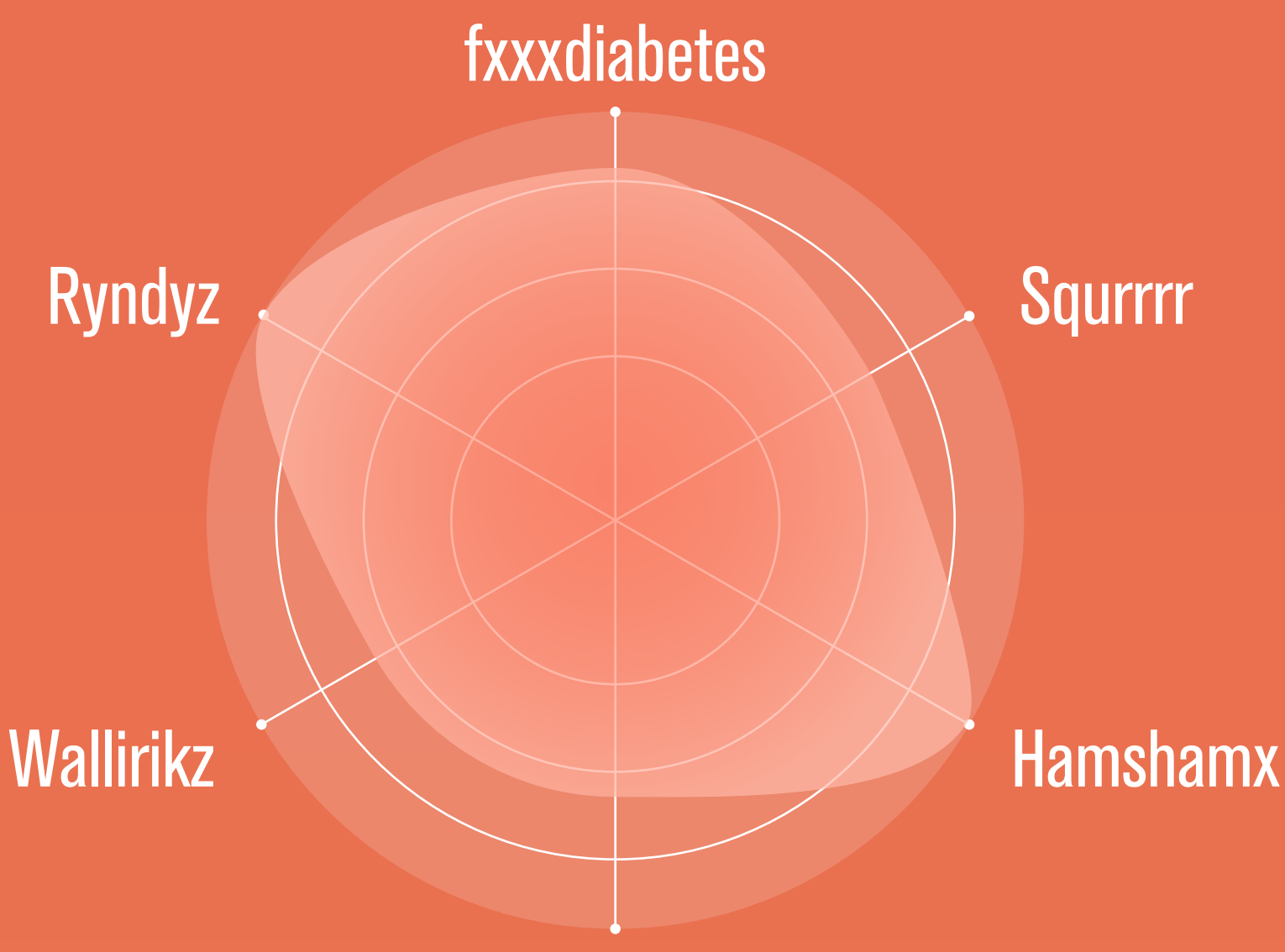
Hamshamx I ate mushroom yesterday.

148
mg/dL

Glucose Levels



Lifestyle transition group 4th



Wallirikz I ate chicken yesterday.

Hamshamx I ate mushroom yesterday.

I need this text...

Send

Pasadena,CA

Whole Foods

Pasadena, CA

- Grilled Chicken
- Crispy Baked Broccoli
- Dried Apricots
- Egg Salad
- Oatmeal
- Carrots with Hummus

Trader Joe's

Pasadena, CA

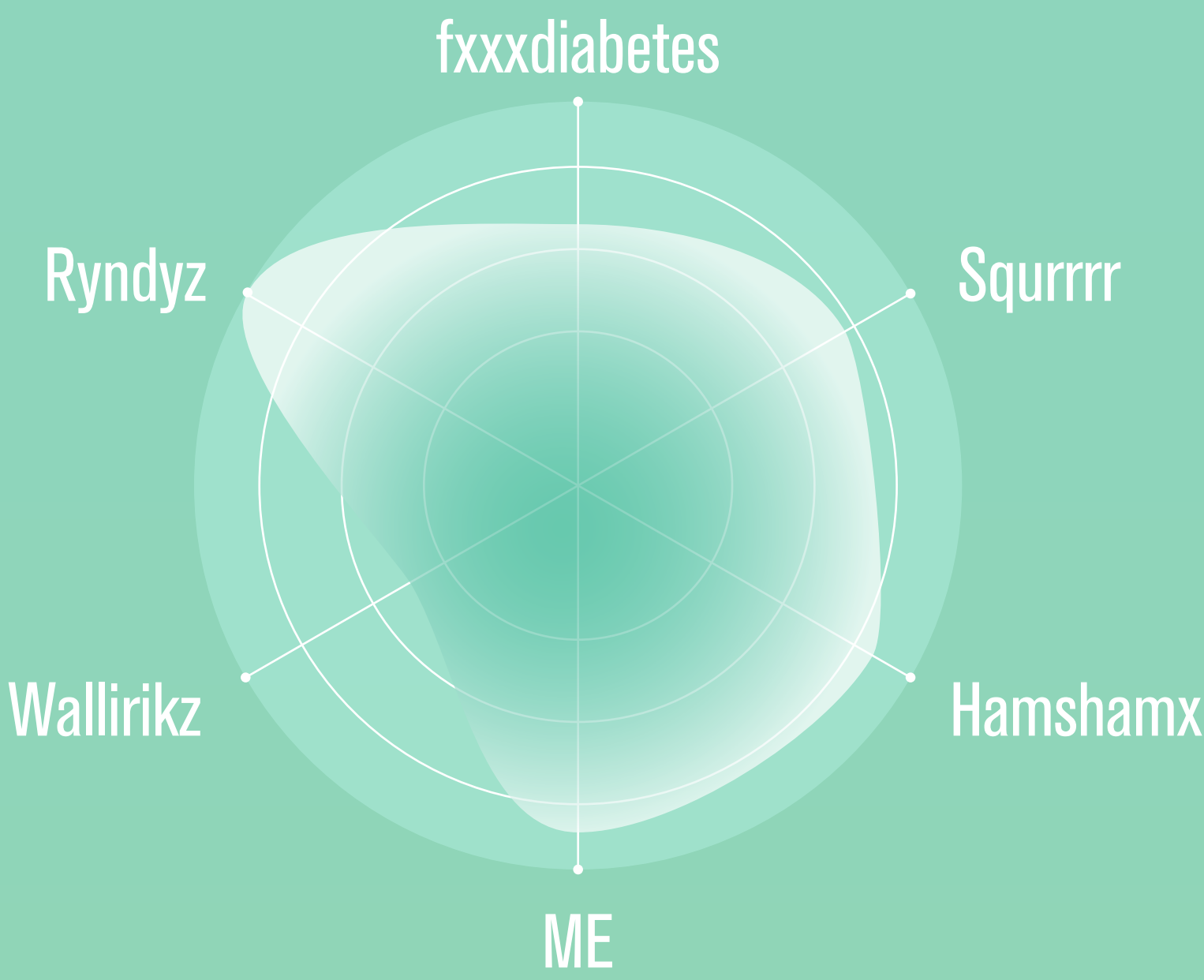
- Grilled Chicken
- Crispy Baked Broccoli
- Dried Apricots
- Egg Salad
- Oatmeal
- Carrots with Hummus

Jamba Juice

Pasadena, CA

4
miles

Lifestyle transition group 2nd



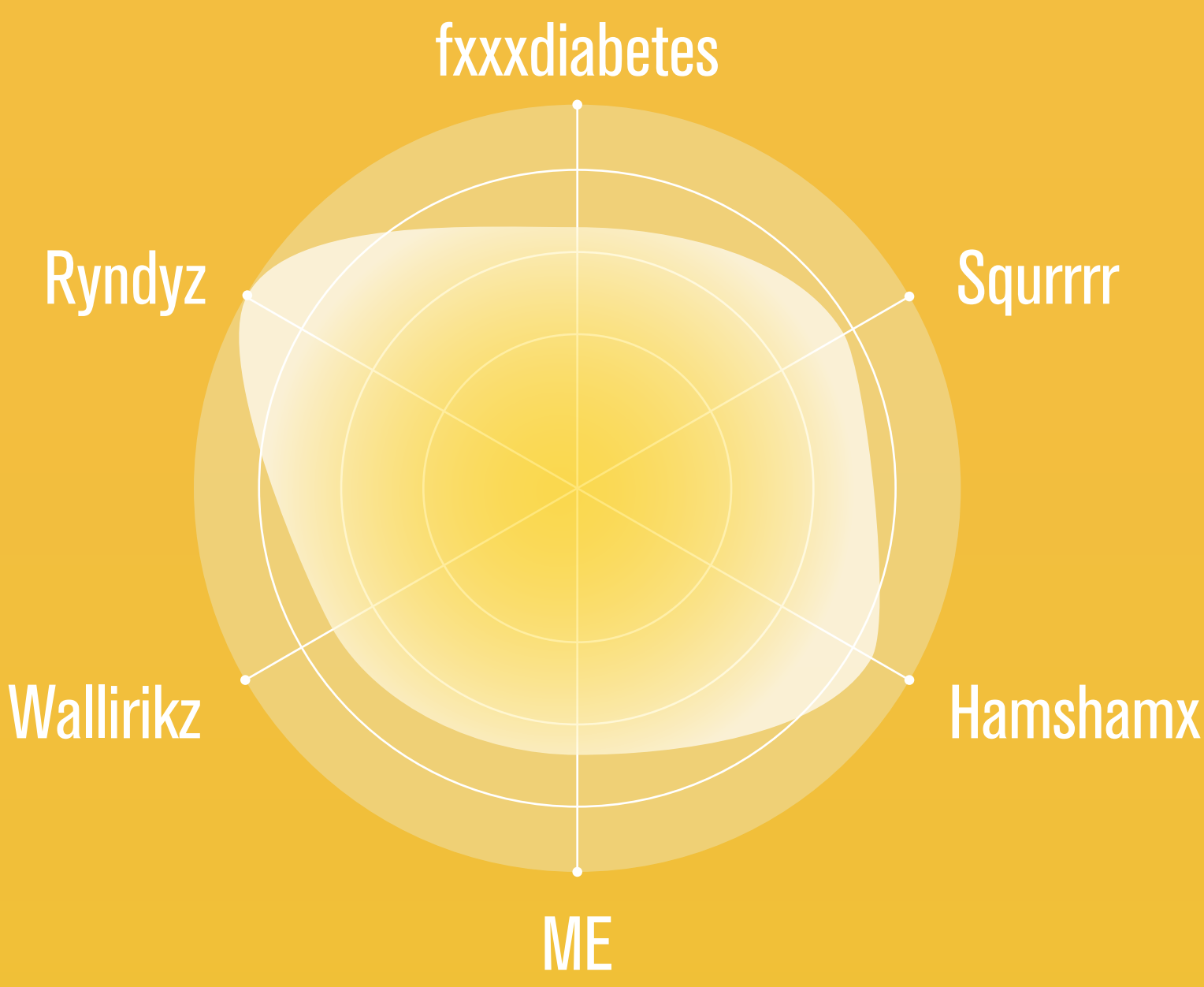
Wallirikz I ran 5 miles yesterday.

Hamshamx I found a great park around.

2
taken

Lifestyle transition group

3rd



Wallirikz: I took 3 pills yesterday.

Hamshamx: I found another medicine.

Will

Set alarm

My transition group

Terms of service

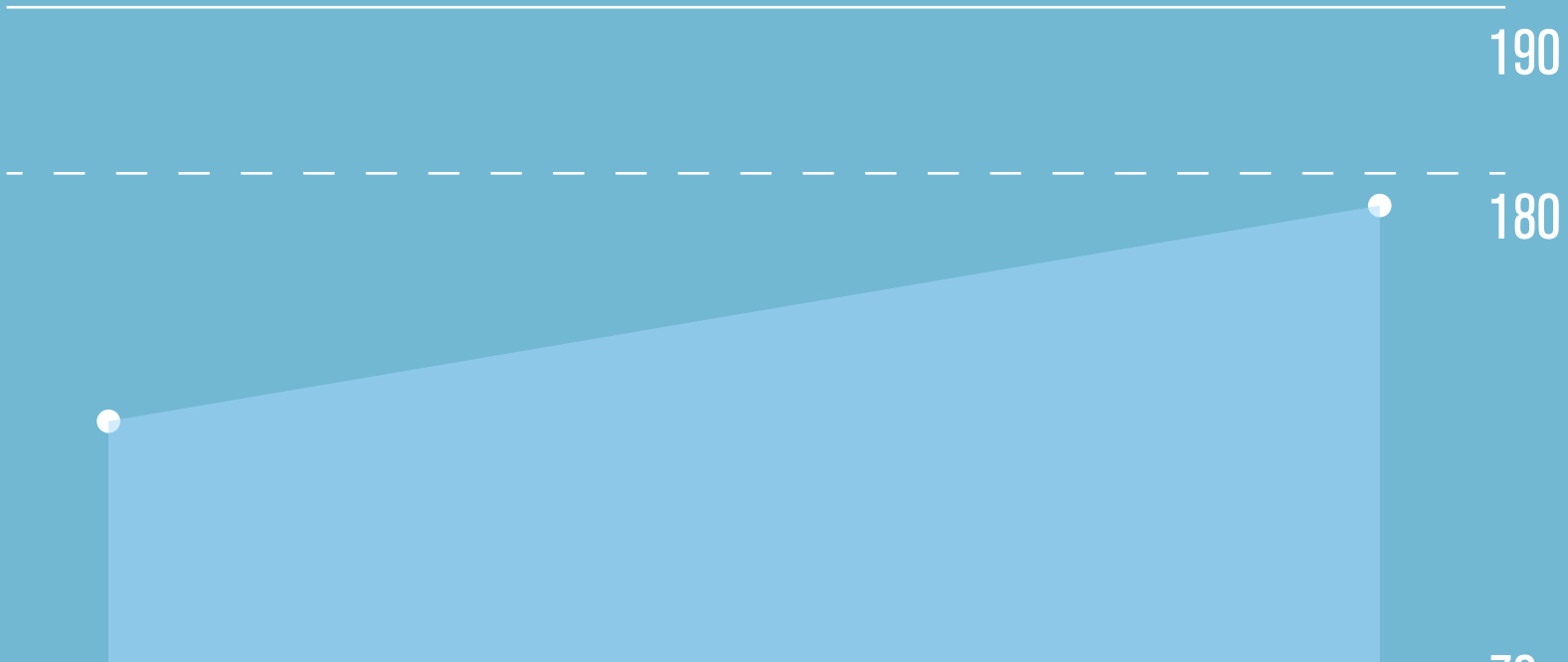
Privacy Policy

Notifications

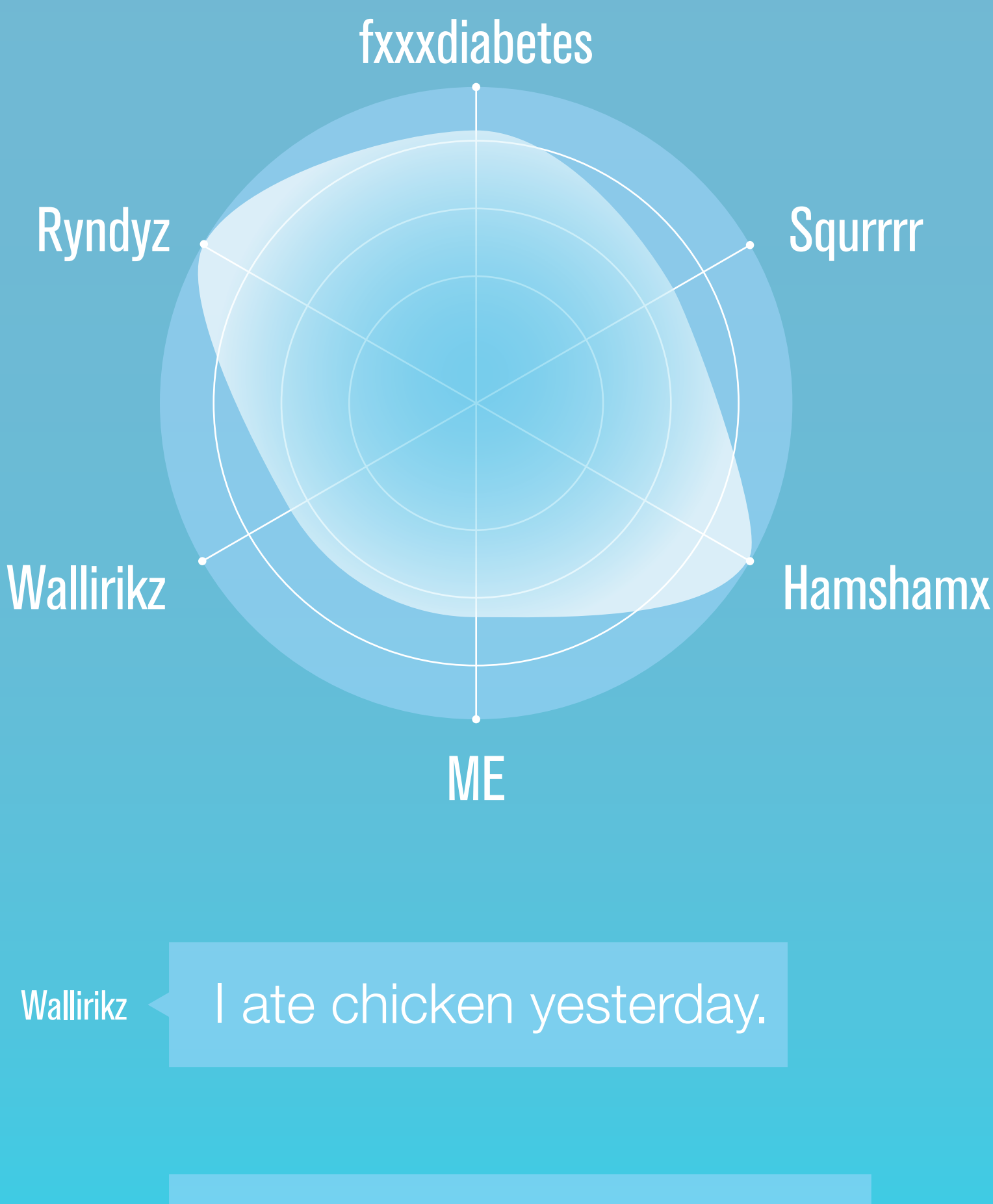
OVERALL

1
meal

Glucose Levels



Lifestyle transition group 4th



Wallirikz I ate chicken yesterday.

Hamshamx I ate mushroom yesterday.

Set alarm

08:00

18:00

--:--

--:--

Set alarm

07	59
08	00
09	01
10	02

save

delete

My transition group

fxxxdiabetes

Squrrrr

Ryndyz

Hamshamx

Wallirikz

change group

Notification

You'er in **Hyperglycemia** status.

Blood glucose levels greater 200mg/dl 2 hours after meals

OR

Blood glucose levels greater 126mg/dl when fasting

OVERALL