This is a design that brings benefits to families with childhood diabetes. It uses APP and wearable injection device to bring comfortable, convenient and acceptable healing experience

02

EIIENE

-INSULIN WATCH

Diabetes was responsible for 6.7 million deaths in 2021, an average of one death every five seconds. Among the patients, the proportion of children and minors is rising sharply. What is terrible is that these groups have not fully self-care ability, but already need to receive insulin injections several times a day to stabilize their blood sugar. In everyday life, the only people who can inject children and minors are their parents. They have to go to school and their parents have to work. However, due to diabetes, the family becomes chaotic, busy and worried. Insulin injection is needed before three meals a day. If given to an untrained teacher, the job can be extremely stressful for both !

At present, treatment programs and measures for children and minors are not perfect or even almost non-existent. They are put on the same schedule as adults, which is obviously unreasonable. Therefore, I conceived EIIENE, an insulin injection watch, and an app for children and minors. In Greek, EIIENE stands for safety and health, and its name is also a good wish for patients.This product can be worn as an ordinary watch in daily life. Meanwhile, it can monitor the blood sugar of patients in real time. If the blood sugar is abnormal, the product can inform the software terminal in time for timely treatment. When injection is needed, after verifying the user's identity, press the product on the arm or arm and follow the instructions to complete the injection. The operation is simple and safe.

UX Design ● **APP Design** ● **Product Design**

BACKGROUND

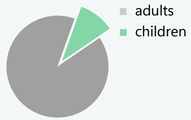
PEDIATRIC DIABETES is an endocrine metabolic disease caused by insufficient insulin secretion.

Childhood Diabetes

When it comes to diabetes, we may have the impression that only adults are prone to diabetes. This is actually a misconception. ***Children can get diabetes as well as adults***.

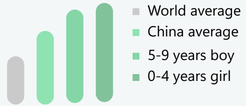
Childhood diabetes is an endocrine and metabolic disease caused by insufficient insulin secretion, which generally occurs in ***school age and adolescence***.

Number of children with diabetes



Average life span of patients with diabetes

Average increasing growth rate per year



Classification of Pediatric Diabetes

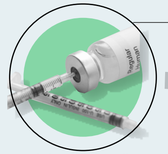
According to different causes, Pediatric Diabetes can be divided into: Type I diabetes & Type 2 diabetes. About ***80-90%*** of children with diabetes belong to Type I diabetes.

Genetic factors — ***Polyphagia*** — ***Thin*** — ***Insulin*** — ***Low insulin level***

The treatment of type 1 diabetes in children is difficult and has a long cycle, which requires lifelong replacement therapy with exogenous insulin.

DiabetesTreatment

Blood glucose monitoring



Injecting insulin

Food limition

Education

Positive attitude

Sports

Basic treatment for type 1 diabetes

Considering the particularity of the population:

How to find a more suitable treatment plan for children from the perspective of monitoring blood glucose data, injecting insulin, dietary guidance and maintaining a positive attitude?

Current Challeges & Problems

	Physiological	Psychology
Parents	-**Carefully and patiently** help and guide them to fight diabetes -Measure blood sugar **timely and accurately** and inject proper amount of insulin -**Control** the amount of each **meal** for children	-Overcome their inner self-confidence and panic -Positive and optimistic to receive treatment -Be **confident** about the future
Children	-Enduring the hassle of **daily insulin injections** -**Playful, active**, hard to control the amount of exercise -**Diet control** is more difficult	-Build confidence and courage to fight against diseases for a long time. -**Overcome fears and prejudice** -**Understand** diabetes accurately and correctly

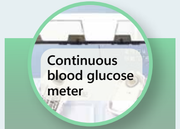
Competitive Analysis

Blood glucose meter

-Voice broadcast
-Before and after dinner can be compared
-Inexpensive

Needle-free insulin syringe

-Pressure jet
-Only slight vibration
-Efficient and fast
-Safe and healthy

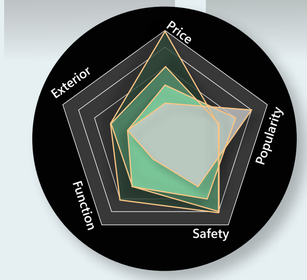


Continuous blood glucose meter

-Prick-free
-Diet tracking
-24/7 monitoring
-Phone sync

Intelligent insulin injection pump

-Protect privacy
-Easy to control sugar
-Injection at any time
-Safe



Market Gap

At present, there are a variety of blood glucose monitoring instruments and insulin injection instruments in the market, but there is a lack of products that can take both into account.

Moreover, the existing products are **not aimed at children**, so they are **not convenient for active children** to use, which is relatively **dangerous**. And it is more difficult to operate

INTERVIEW

Wang

-8 years old
-student

- Pain points
  - -Can't **eat sugar**
  - -Can't run around
  - -Sometimes **be laughed at**
  - -**Frequent injections**

I have to get injections before and after every meal, **many times a day**. I also can't eat candy after dinner like other kids. They can run happily, but I can't. Sometimes there will be **children deliberately avoiding me**.

Miss.Zhao

- Pain points
  - -**No time** to take care of child
  - -**Worried about getting worse**
  - -Expensive cost
  - -Too much **stress**
  - -35 years old
  - -Teacher

I worry about my child's physical and mental condition every day. I tried to **be punctual** and control the dosage of each insulin injection. She can't complete the injection **independently and safely.**

Dr.Li

-35 years old
-doctor

- Pain points
  - -Child with poor self-control
  - -**Product imperfection**
  - -**Parents are inexperienced**
  - -Child emotional breakdown

Parents need to **inject regular and quantitative** insulin.The current therapeutic **tools are limited**, the function is not perfect, so the requirements for parents are relatively high, they need to **be cautious when injecting.**

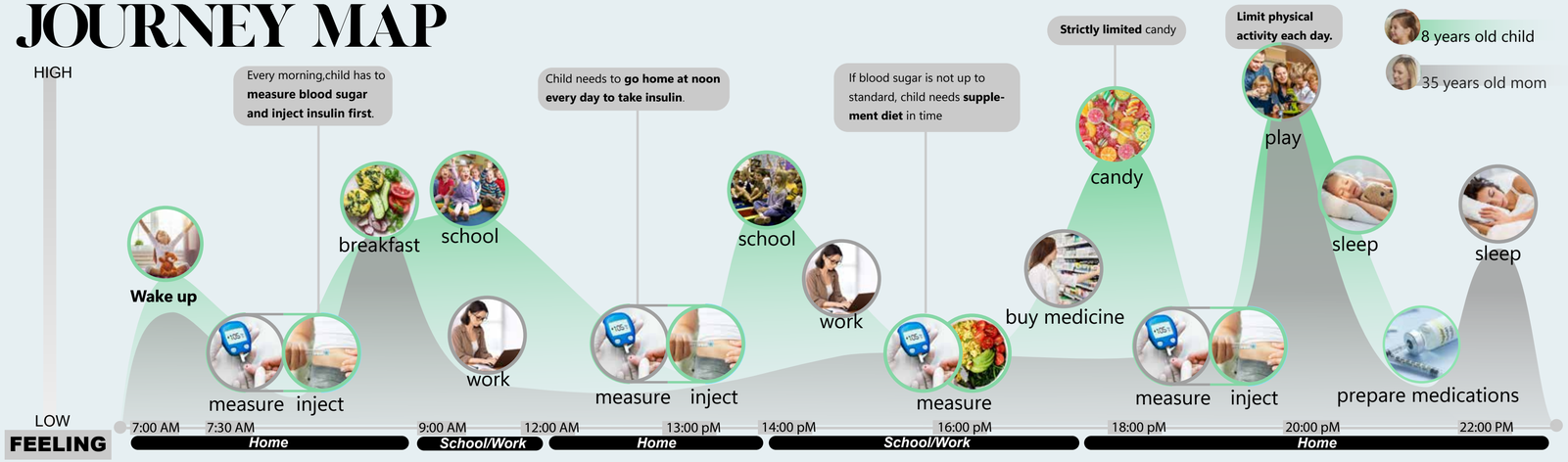
Summary

Child is **afraid** of injections, unable to complete the injection **autonomously**

It is very **difficult** for parents to **operate** syringes and be **punctual** every time

The current product **quality is uneven**, there is no particularly **user-friendly** design

JOURNEY MAP



INSIGHTS & DESIGN OPPORTUNITIES

Child with diabetes need to ***monitor their blood sugar*** several times a day	Child needs to ***inject insulin 3-4 times*** a day and blood sugar levels may be abnormal	Parents ***can't accompany*** their child at all times. Child needs to inject independently	Child ***does not know where to inject***, and the injection location cannot be the same	Child is afraid, evasive, ***fearful of the injection***	Parents ***don't know if*** their child ***has completed*** the injection
Data synchronization	**Light up and vibrate**	**Press**	**Mark**	**Needle-free**	**Residual mark**
This device can monitor blood sugar **all day in real time**	It **lights up** to remind you to inject and **vibrates** when blood sugar is abnormal	Use **pressure** instead of injection, reduce the difficulty and risk of injection	Use a **special mark** to mark the injection site. As it is injected, the mark **disappears**	**Hide needles** and **Shift of attention** to reduce negative emotions	The **mark** on the child's body indicates whether the injection has been completed

FINAL IDEA

APP

- Real-time monitoring
- Data analysis
- Interaction
- Diet recommendation
- Emergency contact

Product

- Insulin injection needle-free
- Easy to carry
- Monitoring data
- Safe and efficient

Work Flow

Parents

step 1

The product must be paired with the phone

step 2

Store

Parents should store enough insulin in the product every morning

step 3

Clean

Parents should clean the injection port every morning and evening

Children

step 4

Wear

Parents should clean the injection port every morning and evening

step 5

Remind

The product alerts the child when it's time for the injection

step 6

Inject

The product automatically completes the needle-free pneumatic injection.

Recognize

Before injection, the product will confirm the child's fingerprint

Safe

Child will complete the insulin injection safely on his own

Synchronizing

The phone can see blood sugar data detected by the device

Report

If data is abnormal, the product will vibrate and report data to the phone

Automatic

The product could automatically detects blood sugar in real time

Inconsequential

Wearing this device daily, child can study and exercise normally

APP DESIGN

Site Map

APP

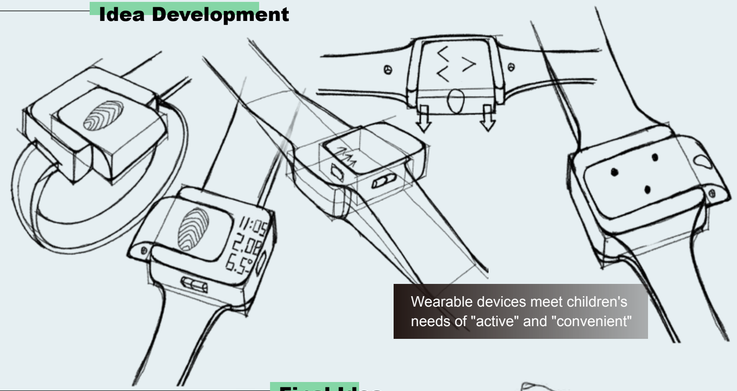
- **Home**
  - Articles
    - Communication
    - Doctor's article
  - Daily sharing/communication
  - Resident physician — Share advice
  - Health report
  - Dietary advice
  - Ask for help
- **Product**
  - Blood glucose
    - Current blood sugar
    - Automatic report when abnormal
    - Recent — **Change law**
    - Forecast — **Intelligent appropriate injection time**
    - Data Shared
  - Equipment
    - Insulin
      - Injection data
        - Frequency
        - Time
        - Dosage
      - Effect
      - Anomaly detection
    - Interaction
      - Call — **Automatic call when abnormal**
      - Heart
      - Location
- **Personal**
  - Information
  - Recovery condition
  - Drug accumulation
  - Complete data
    - **Data analysis**
    - **Anomaly accumulation**
  - Friend

Wireframes

The app aims to help the users of the product and their guardians to understand the patient's own situation more comprehensively, timely and accurately, understand the physical changes, and better follow up treatment.

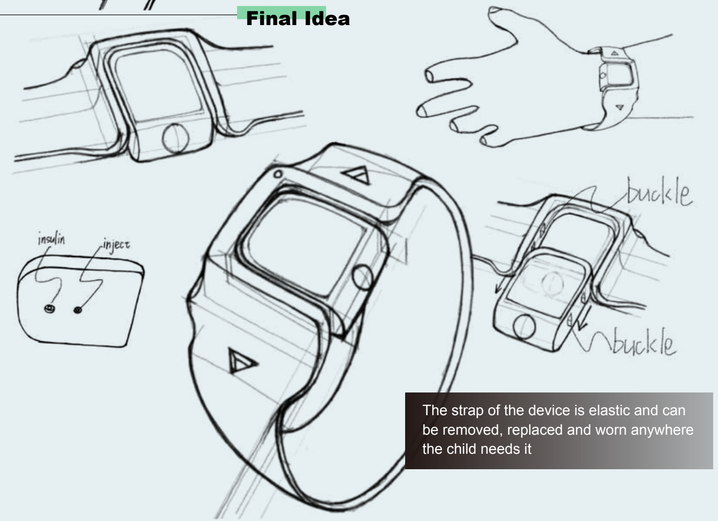
SKETCH

Idea Development



Wearable devices meet children's needs of "active" and "convenient"

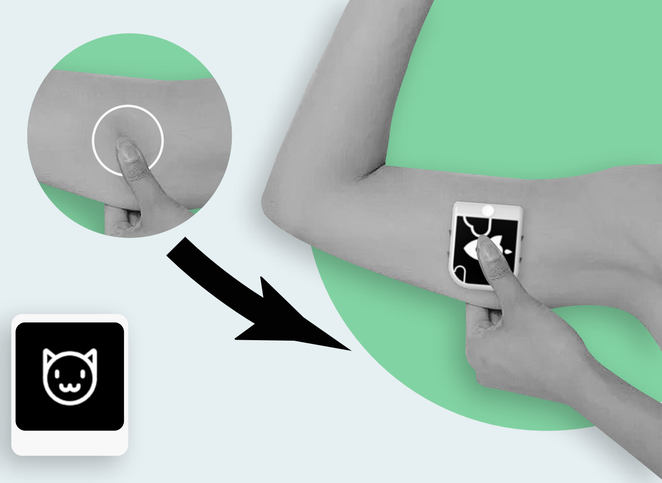
Final Idea



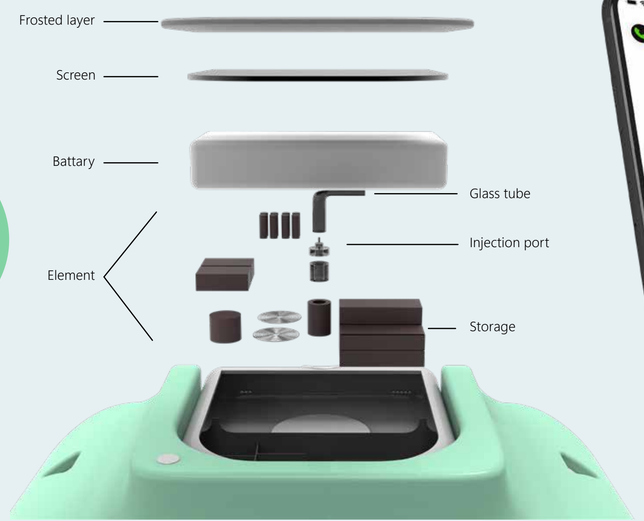
The strap of the device is elastic and can be removed, replaced and worn anywhere the child needs it

PRODUCT DESIGN

- Users can snap it out of its groove and place it in their arm for a ***needle-free injection***
- Users need a ***fingerprint*** to unlock and hold down for 3 seconds ***to activate*** the injector
- In order to ***reduce the child's fear***, animation effects are triggered during the injection process and a ***reward mechanism*** is added after the injection is completed



At the bottom of the device are injection ports, cushioning pads and sensors



Parents can click to convey their love for the child through APP interaction

UI DESIGN

Logo

Color

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#32D4A4 #32D4A4 #32D4A4

Font

Abc-Comfortaa

Icon

Initial interface

These show the registration and login interface

Auxiliary interface

These show the community ,daily diet recommendations and so on.In addition, parents can see doctors articles.

Functional interface

These show users home page, other doctors' homepages and device information, parents can view the child's data, browse other parents' sharings, view the device information and so on

Data interface

These show real-time blood glucose data, recent blood glucose and so on

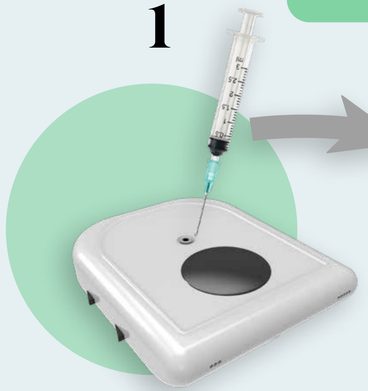
Parents can check their children's blood sugar status on the app, supervise and supervise the completion of the injection, and bring emotional encouragement to their children through the interactive mechanism linked with the product

FINAL OUTCOME

Work Flow

It is believed that this design can bring changes to tens of millions of children with insulin, and they will abandon the needle, stay away from the scar of injection, and no longer be subjected to the special eyes of others, so as to restore the life of normal children and normal families

1



The main process starts with preempting the INSULIN WATCH with insulin, which is stored in the product

The device vibrates to remind the child when to inject insulin; The APP will also monitor blood glucose data in advance and remind the injection time according to real-time feedback

2

When an injection is needed in the middle of the day, the product is put on the arm, and after final identification through the fingerprint, the product can be injected with insulin.

3

The injection method is to drive the drug into the subcutaneous tissue through high pressure, which is safe and convenient, and can be further stabilized by auxiliary hand pressure on the product.