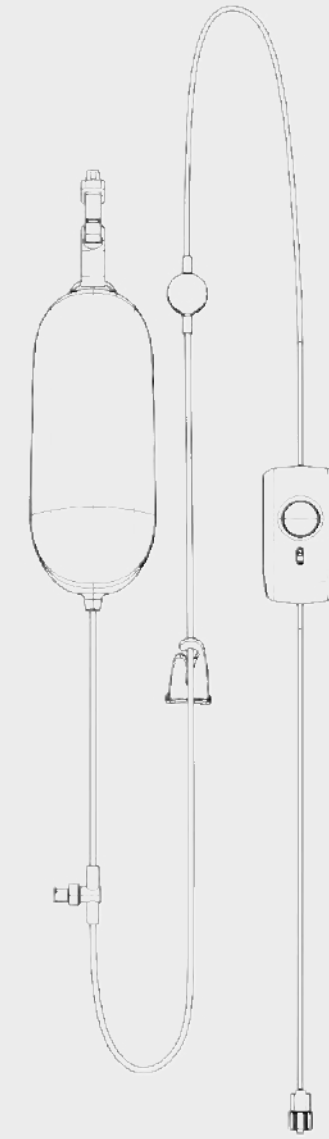


WEGO 威高

≡elastomeric infusion Pump

introduction



Objectives

To come up with a **unique** aesthetic direction for **Reservoir** and **PCA**
Optimize the Industrial design based on user study and ergonomics

Company

Wego is China's one of the **largest** manufacturer of medical consumables and materials
They export their products to 30 countries including United States, Germany, Romania, Australia and UK

Challenges

There was a huge **communication gap** between me and client as they can only converse in Chinese
I planned to use **storyboard to communicate** the problems and solutions, which worked
Being a medical product, It was a tedious project and needed a **proper plan** before executing

Research

The first stage was to fully understand the problem. This involved creating an activity analysis framework (AAF) which was developed from a **series of interviews** conducted with healthcare **professionals** and **patients**. The research included the examination of existing products by the **manufacturers** and **competitors**.

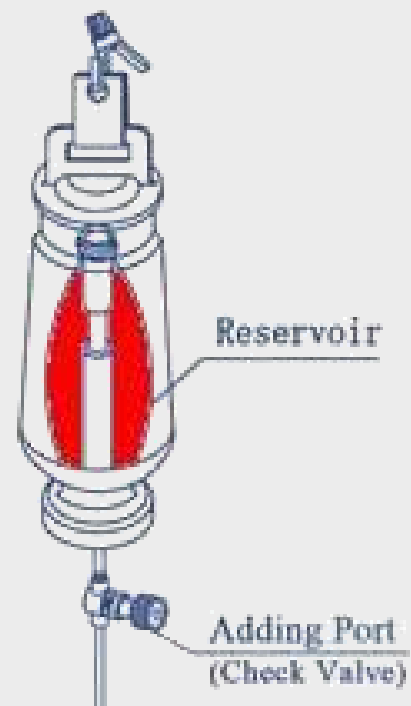
How it works?

Step 1



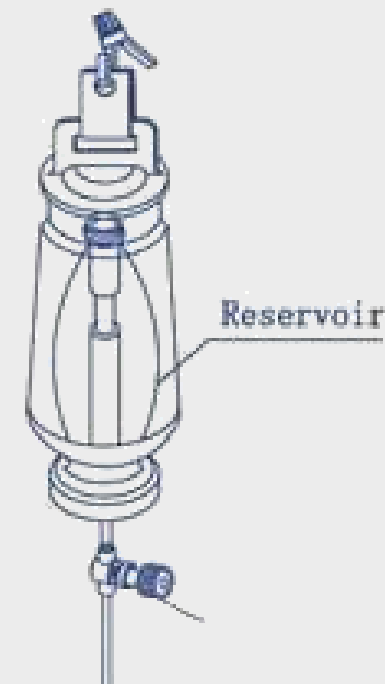
Firstly, the stopper is engaged to fill the medicine

Step 3



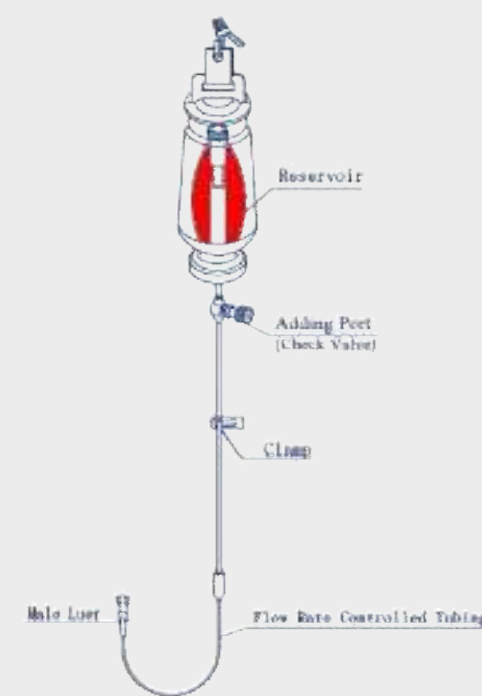
The compressive force of balloon delivers medicine at a constant flow rate to patient

Step 2



With the help of **syringe**, medicine is **injected** via Inlet Valve which results in swelling of elastomeric balloon in the reservoir

Step 4



The pump is connected to the catheter of patient and then the stopper is disengaged

Various parts

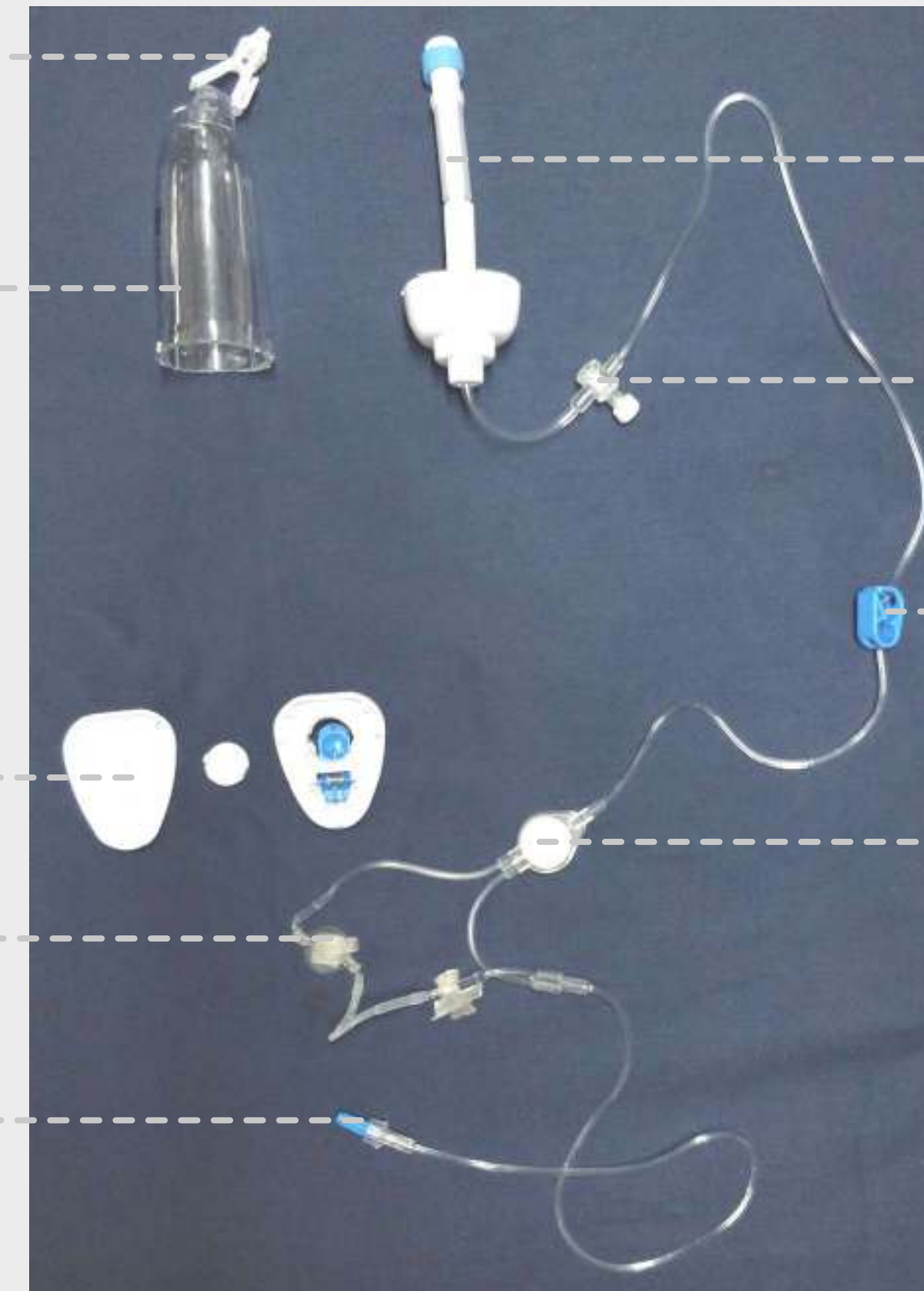
Clip
used for clamping / hanging the reservoir casing

Reservoir Casing
works as protecting cover around the elastomeric balloon

PCA Module
used for dispensing **extra 0.5ml** as and when required depending upon the patient's condition and amount of pain

Sub-Balloon
used for storing 0.5 ml and takes 15min to refill

Catheter end
used for connecting the pump to the patient through IV



Silicon Elastomeric

Inlet Valve
used for injecting the medication in to the reservoir

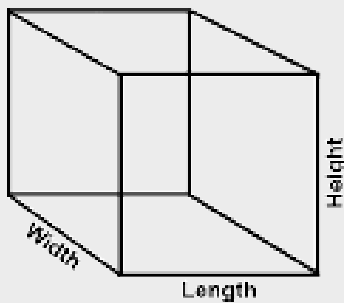
Clamp / Stopper
works forstopping the flow of medication as and when required

Filter for foreign particles
works as filtering element, protecting from foreign element and stops the air bubble

Physical Attributes



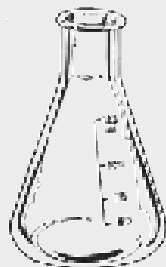
Flowrate



Dimensions



Weight



Volume

Provision for



Medicine details



Patient details



Duration



Date and time of running medicine

Intended Environment



Ambulatory use



Clinical



At home



While walking

User age group

Specific age group(s) should be considered as each has their own **needs** and **problems**

Environment Conditions



Water exposure



Altitude



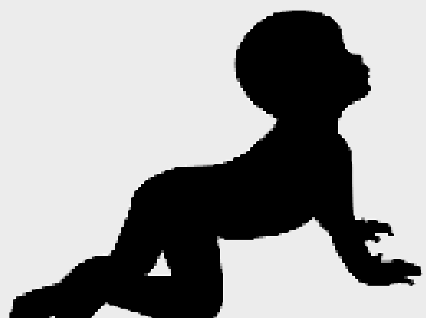
Magnetic Field



Room temperature



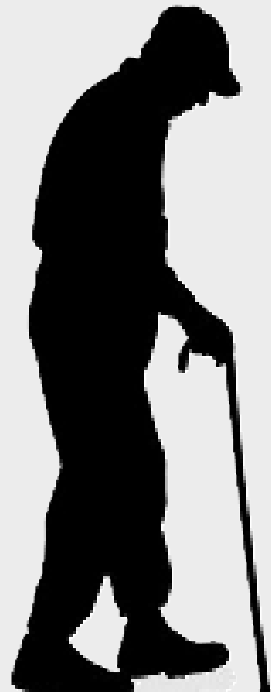
Neonate



Infant



Adults

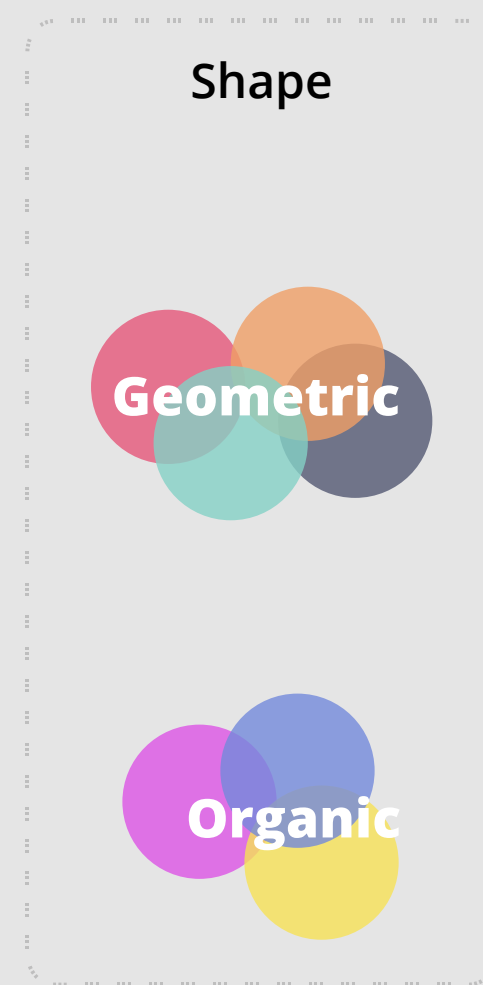
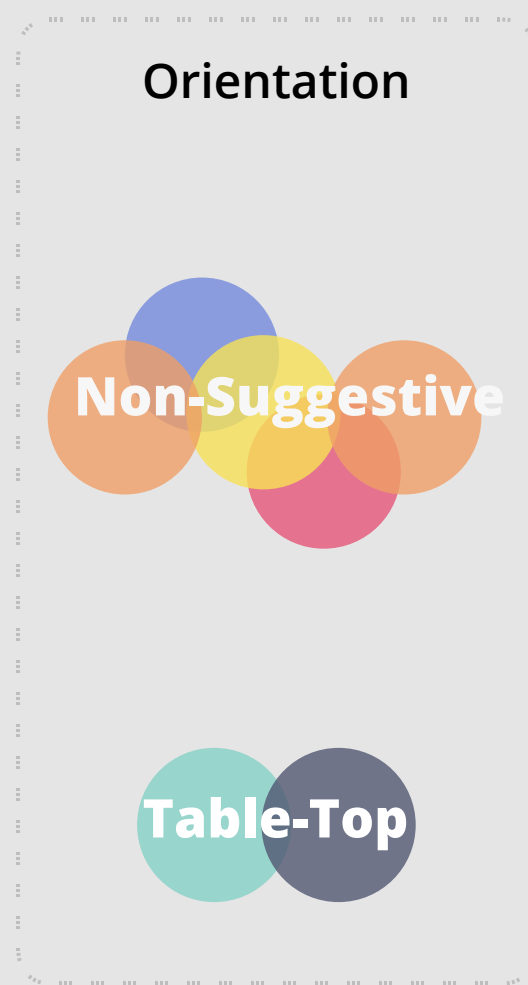


Elderly

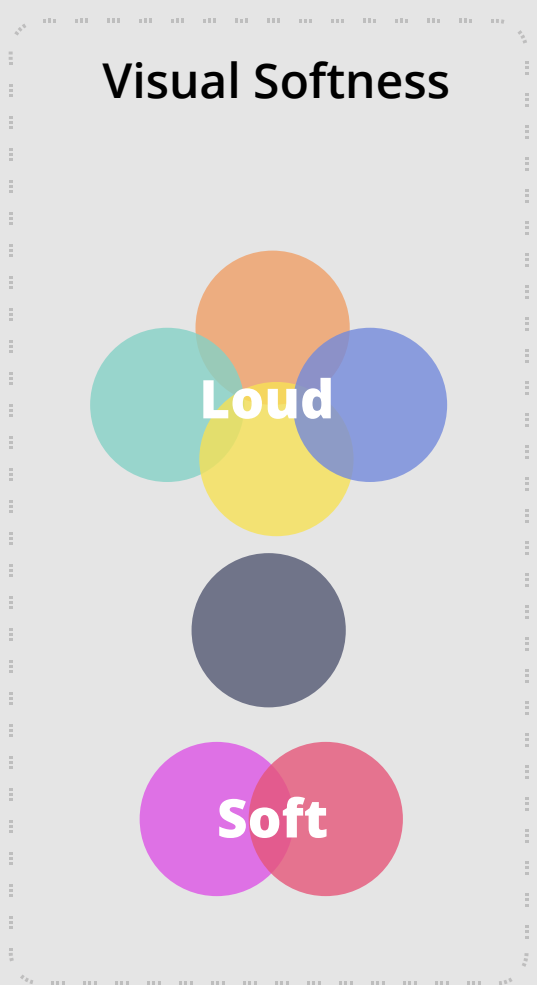
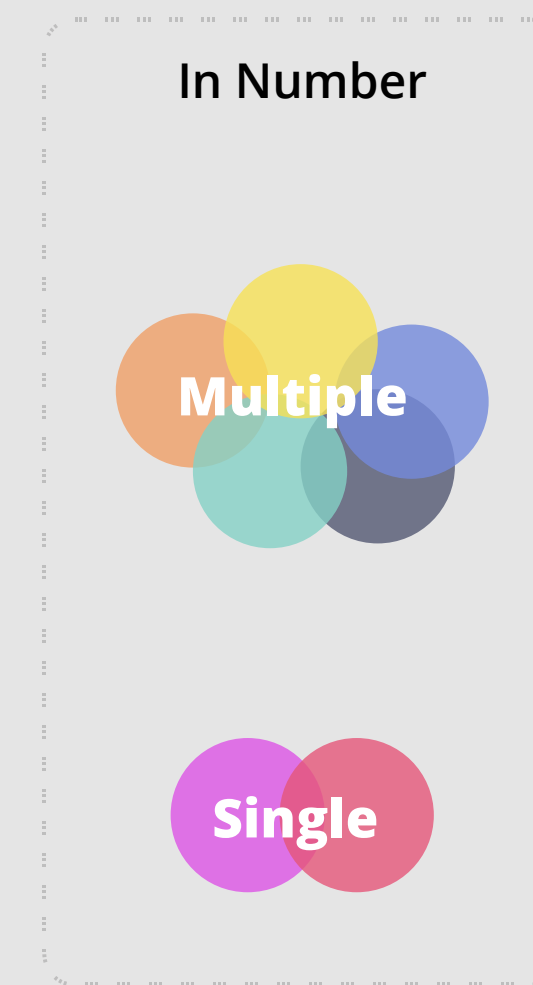
Competition Analysis

Aesthetics for any product is subjective, so I tried to understand this parameter by **breaking down aesthetics** of competitors. This helped me in understanding the **lack of aesthetics element** in the **medical products**.

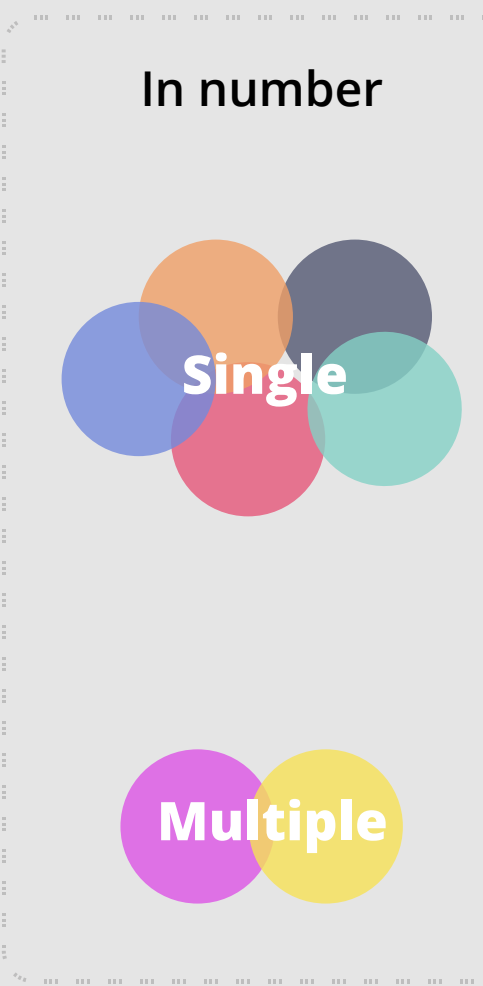
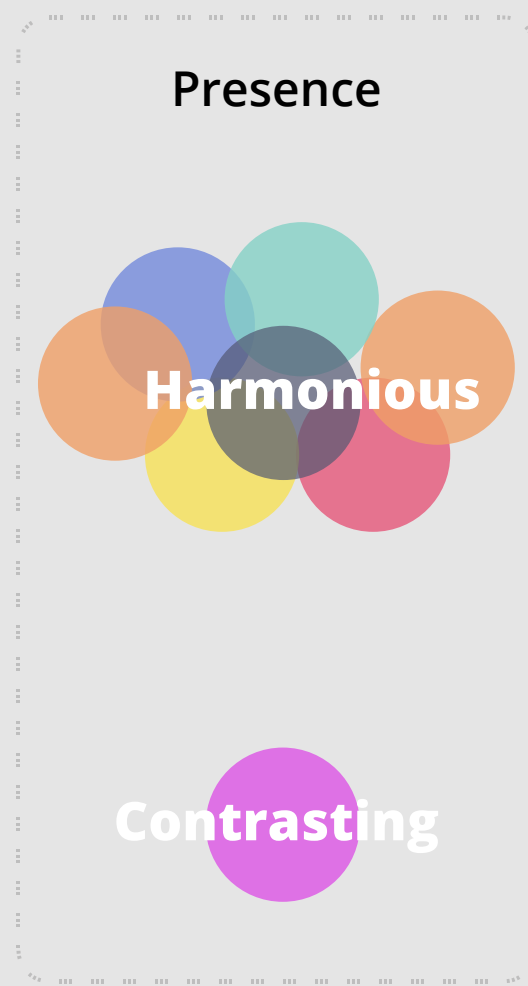
Form Elements



Color Treatment



Texture

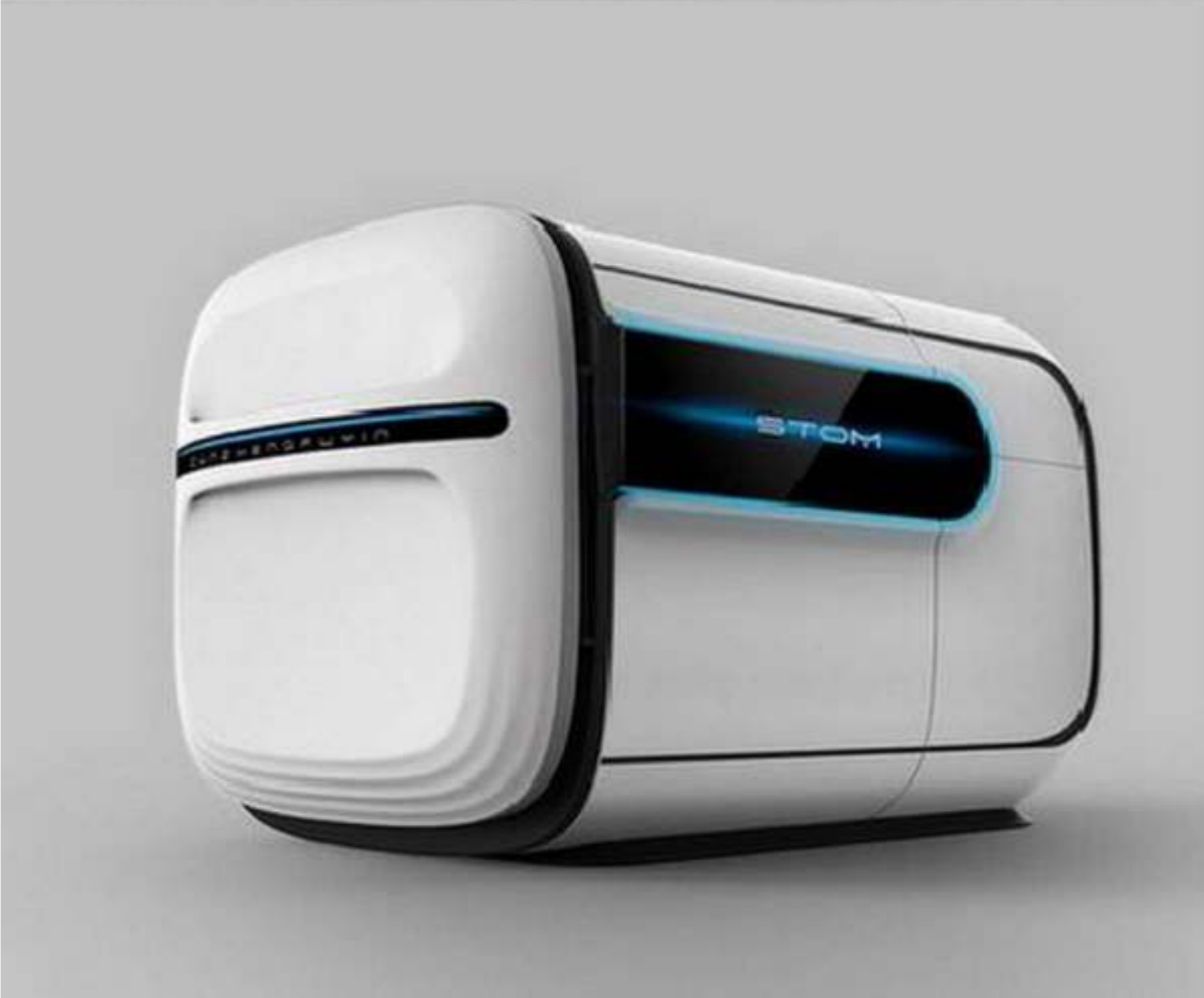
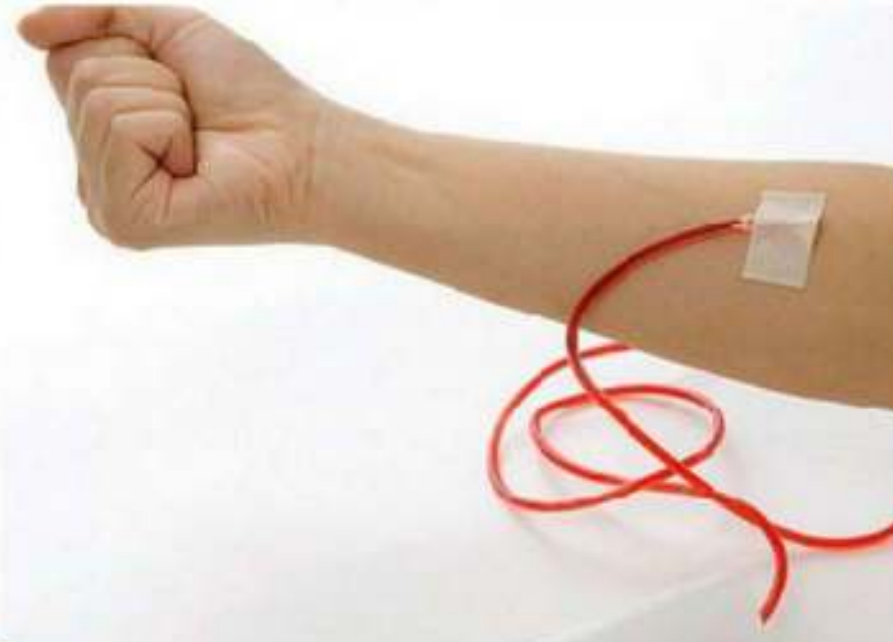


Joining Relationship



innofuser	Dosifuser	Baxter	Vikyfuser	Coopdech	Accufuser	B. Braun
						
						

Moodboard

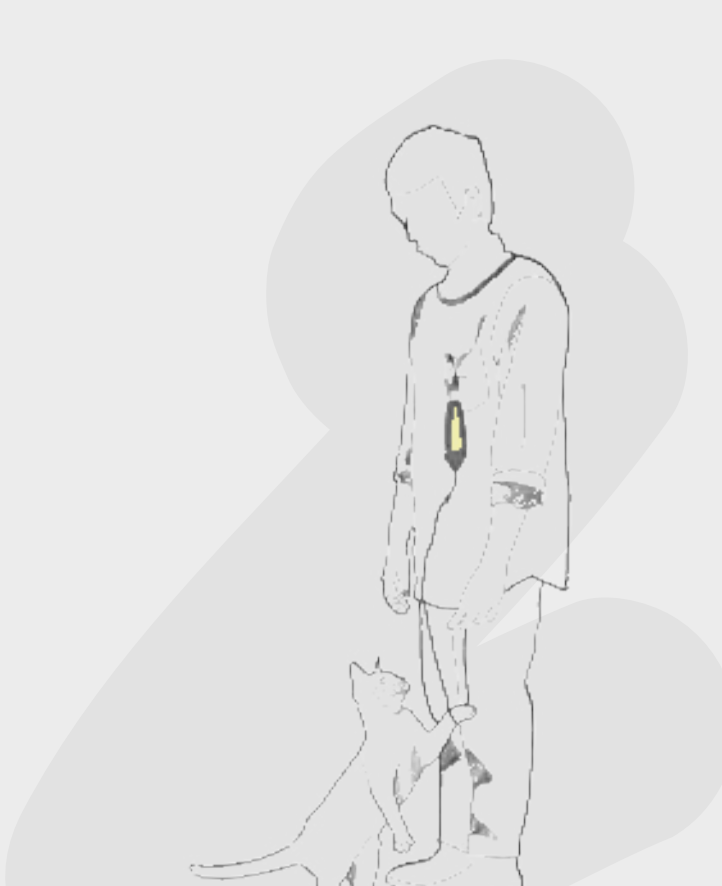


Usability Pain Points

While doing my research I found out that this product is **not popular in India**, but to understand the product and to study its intended purpose, **I wore the product for a week to simulate the usage** while understanding what all daily **usage problems** user might face.



PCA lands in patient's hand inticing him to **play** with it



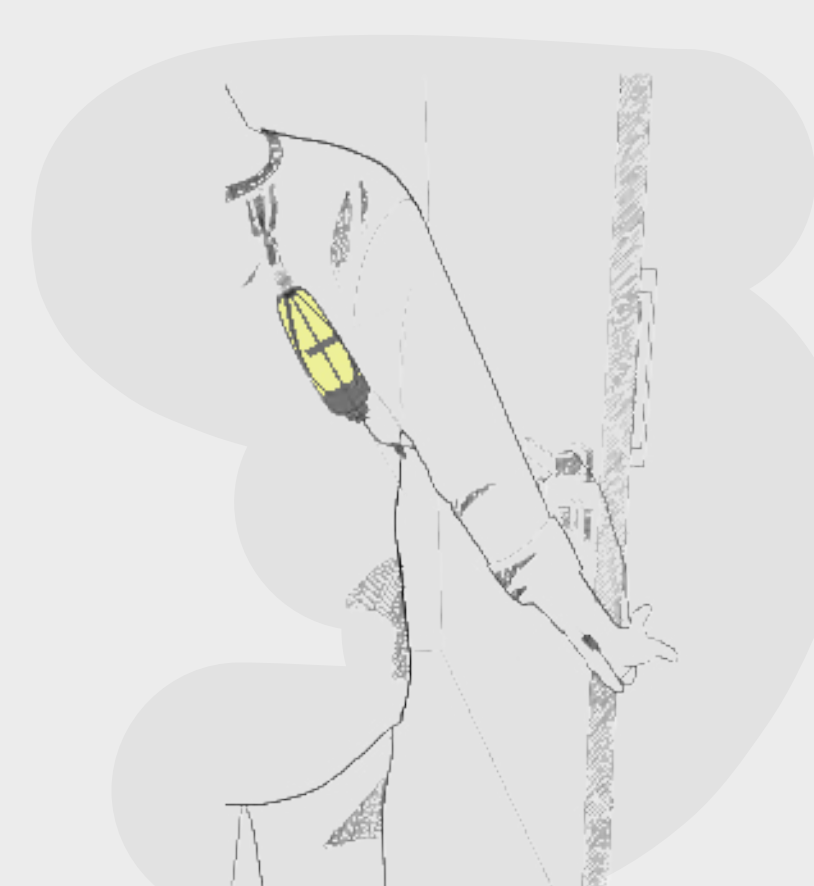
Pets plays with the dangling tubes



Sharp teeth on clamp tears the clothes



Difficulty in **changing clothes**



Dangling **tubes gets stuck** in surroundings

Problems identified in infusion pump

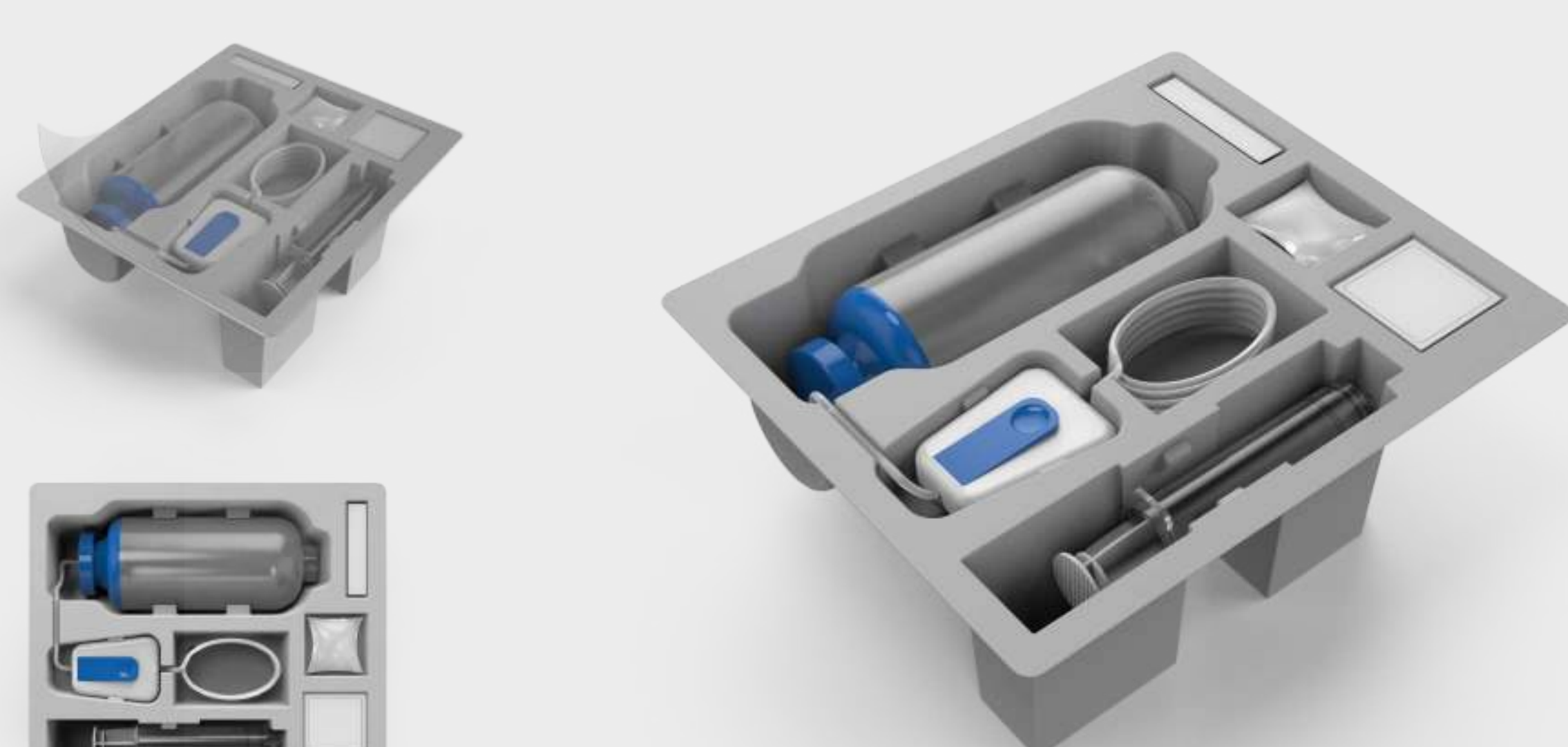
There were some basic problems identified in the product which should be addressed regardless of any proposed concept. Solutions to these problems were proposed by introducing them into the concepts itself which later can be married to final selection, according to the company's need.

Problem : Possibility of exchange of medicines among patients



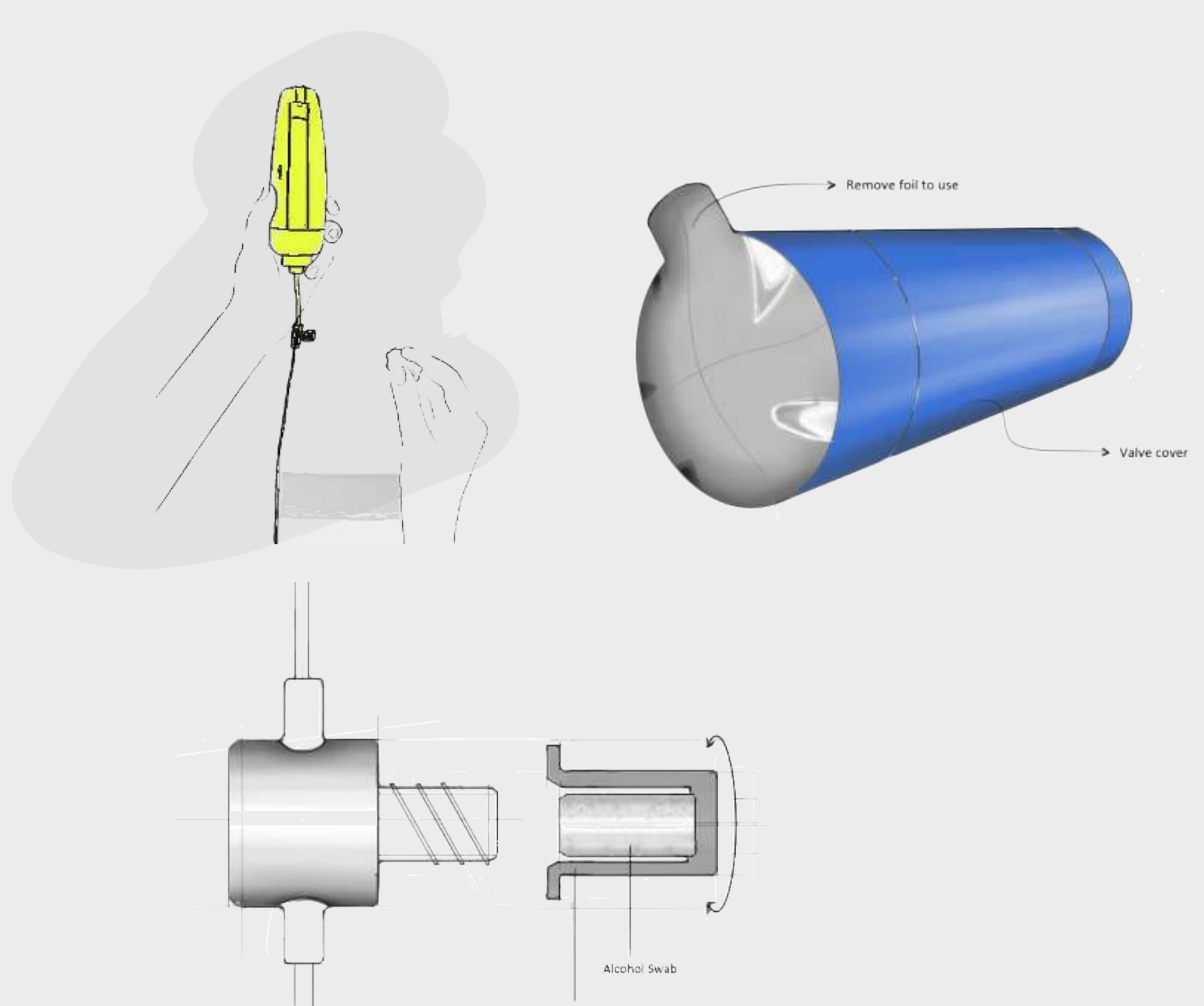
Cluttered environment | Number of people in same room

Solution : An infusion pump kit with patient specific preparing instruments, medicines and information



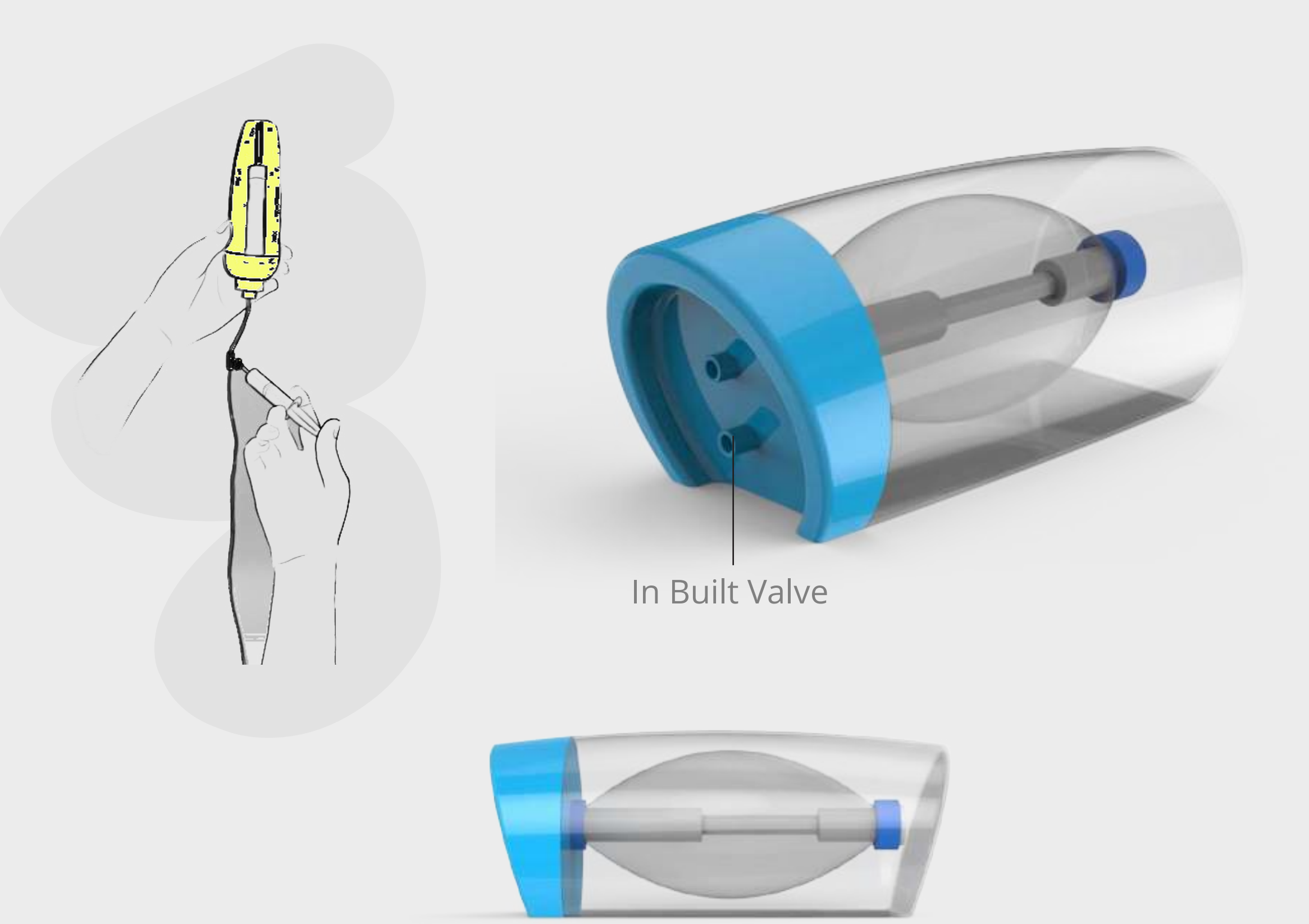
Problem : Improper **sterilization**

Solution : Inlet valve cover with **in-built alcohol swab** can be used while removing for injection



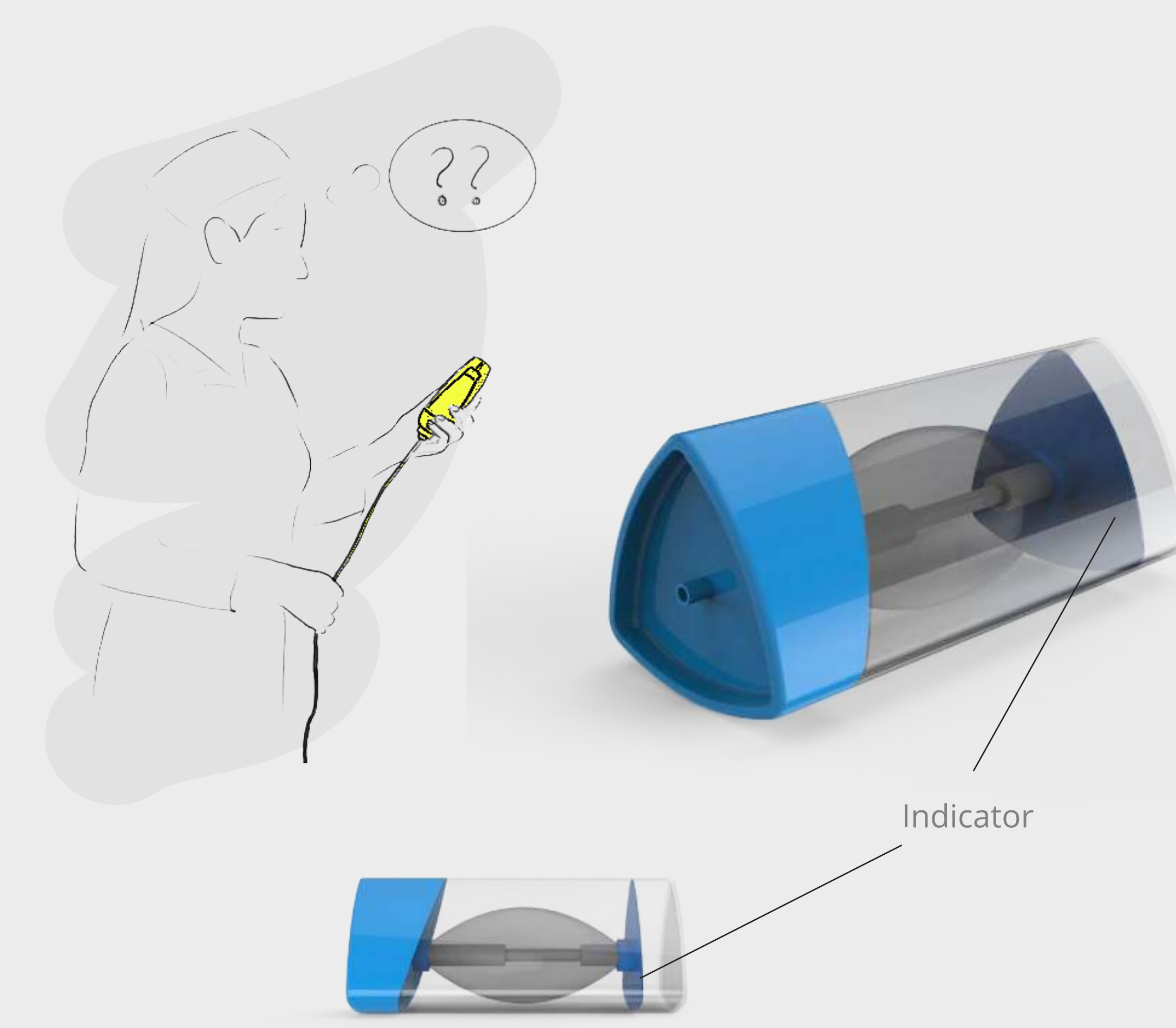
Problem : Difficulty in injecting medicine

Solution : Inlet valve **incorporated into reservoir**



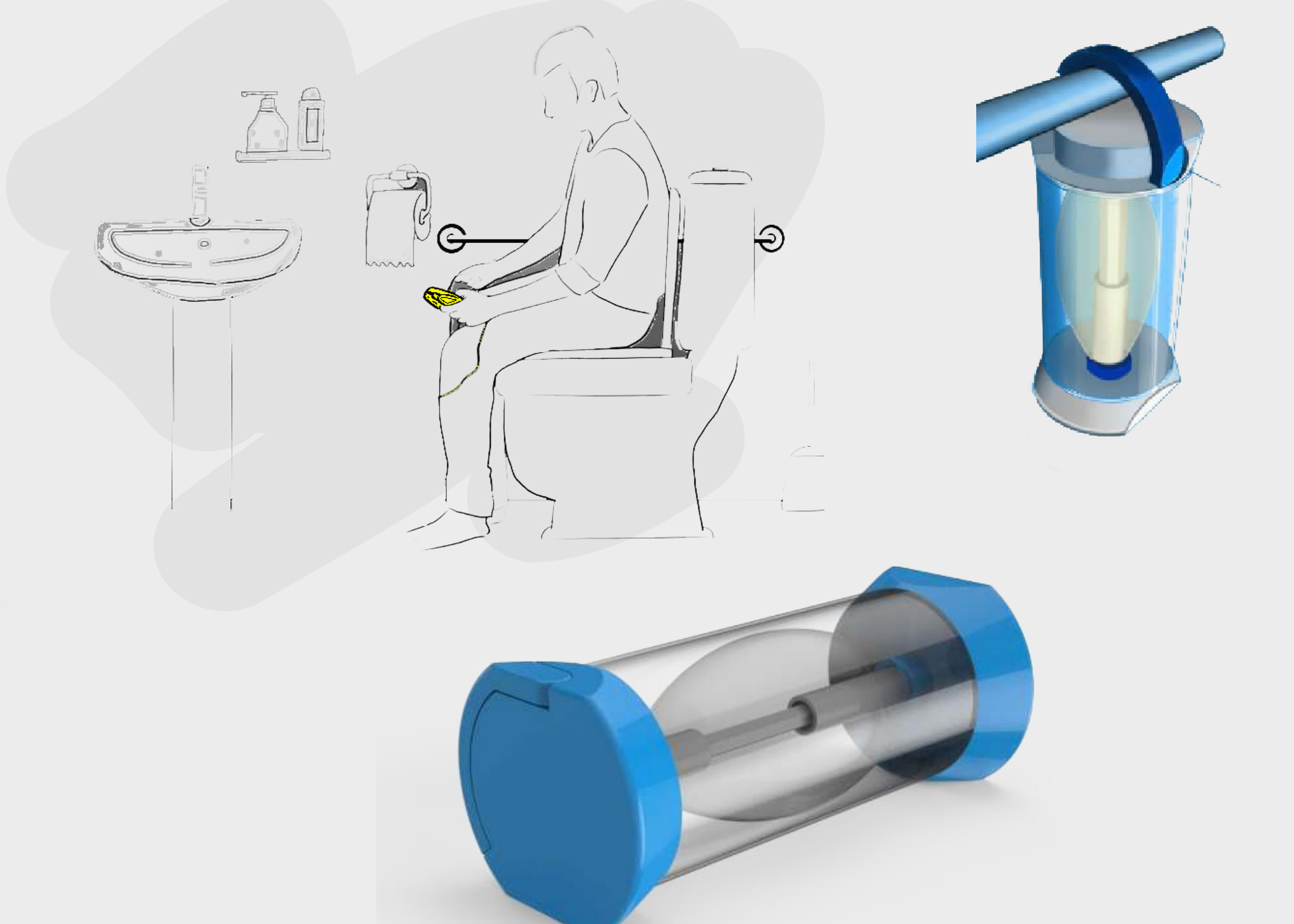
Problem : **Live feedback** of infusion pump working

Solution : A plastic plate **indicator** mounted on central telescopic arm which moves as the volume reduces



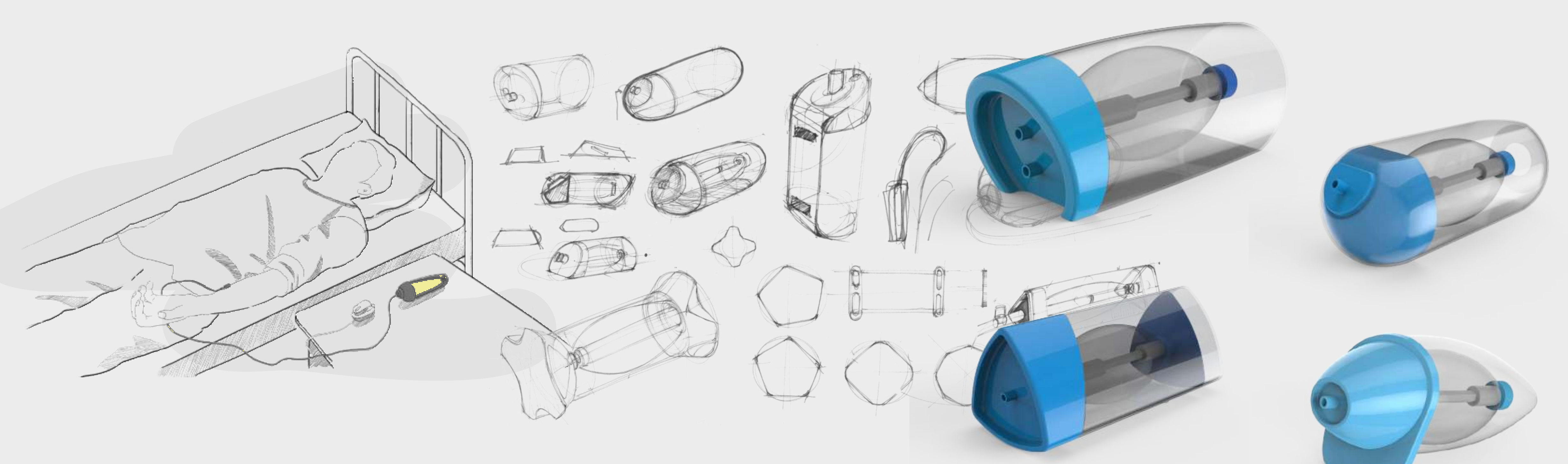
Problem : Need quick and easy **mounting** while moving around

Solution : Inbuilt **hanging** solution



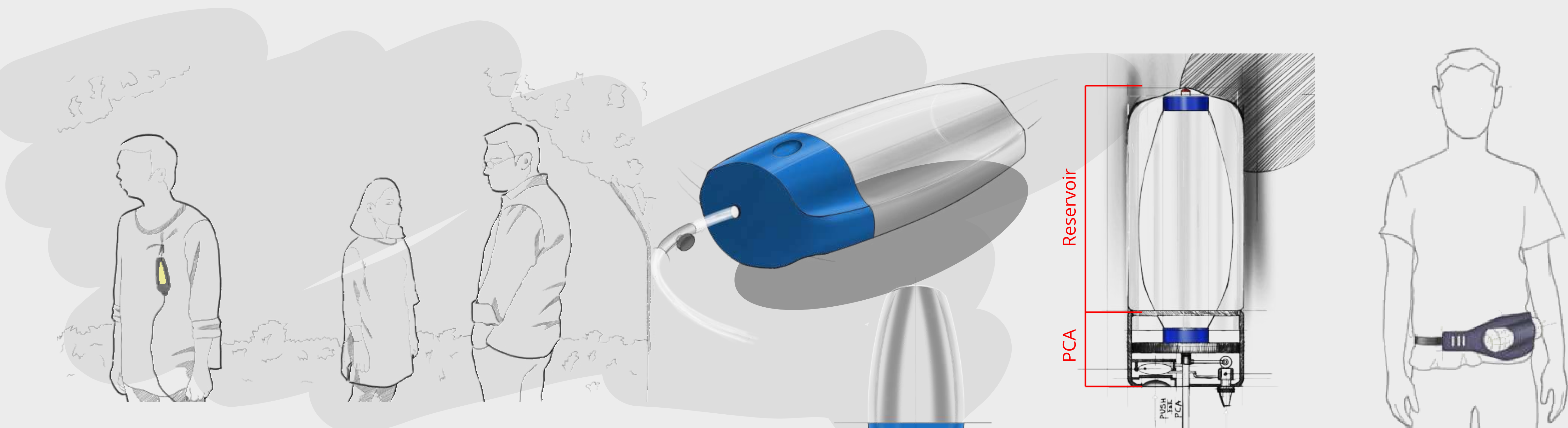
Problem : Product **rolls down** when kept on **table** while sleeping

Solution : **Straight cut** or **geometric faces** can stop rolling of the reservoir



Problem : **Psychological burden** when worn outdoors

Solution : **Wearability option** with an **organic shape** for a medical device, **In built PCA** prevents any **unintentional usage**



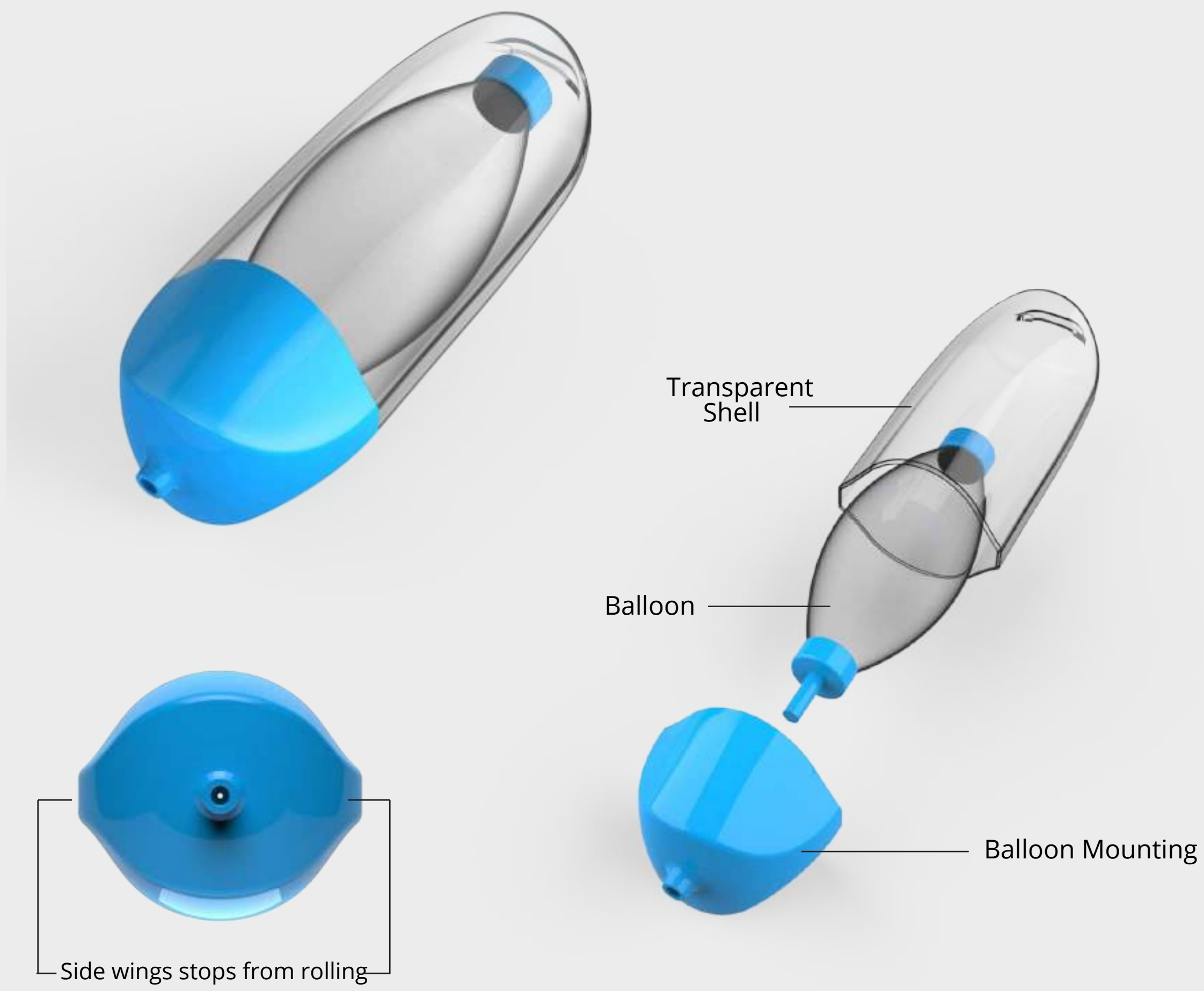
Mock-up



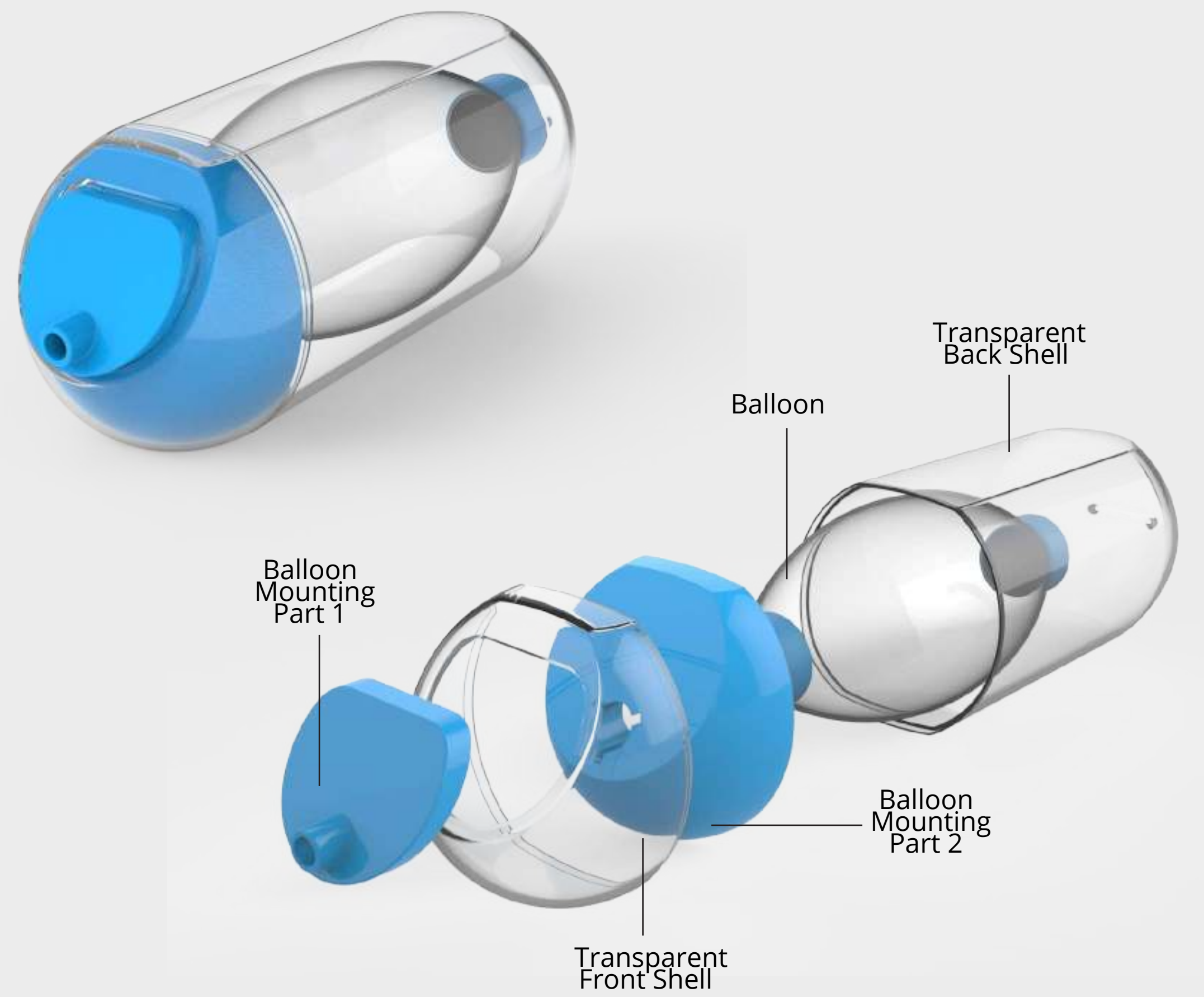
Final Designs

Final designs were selected by the client according to their requirements. Client's requirement was to bring a radical aesthetic direction in the market. Although, I was successfully able to make them aware regarding the scope of re-designing the infusion pump and now they are moving forward with the production while working on the suggested solutions.

Reservoir 1



Reservoir 2



Prototypes



PCA 1



PCA 2

