OSAA Collider
Diego | Yen - An
Who are we designing for?
Jane, 65+, Retired, Home Infusion Therapy (Parenteral Nutrition)

Usually carry a 2-3 liter IV bag
The buy IV pole
Stay at home
35% potential market share; estimated revenue is $2,280/patient.
What is the **problem**?
“.. I don’t understand how to set it up”  
“.. what if it is too heavy to carry”  
“.. emotionally, it affects you seeing something as ugly as an IV pole”
simple  light  seamless

Elder Users
".. a common problem is the flow is cut into the vein..

".. I'm worried patients' IV set will tangle..

".. you have to make sure pressure is constant on its own..

Nurses + Doctors
What is the design?
Overview | IV Access Points

MOVILIV BELT

pusher $1.46
spring $4.34
box $13.06
Dosi Fuser Pump $33.84
flexible end $1
line clip $0.55
Belt $2.12

SINGLE UNIT TOTAL = $56.37 (Not MP)
But wait, **how** does it work?
Ease of set up and replacement
Trigger message when fluid is running low
NO GRAVITY!

Clip control
Vein Entry Control | Design

**problem**

**solution**
How do we sell it?
**BUSINESS | Go-To-Market**

**Market:** US Independent Service Providers for Home Infusion Therapy  
($172.5 million by 2018, estimated by 35% of market share)

**Objective:** Become the first portable IV solution provider in California.

**Goals:**
1. Adopted by 10 house infusion therapy pharmacies  
2. Included by 5 health insurance coverage providers  
3. 50 testing trials in total

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Initiatives</th>
<th>Measures</th>
</tr>
</thead>
</table>
| 1. Fine-tune product features and define product benefits | - Partner with **Berkeley Retired Center** for testing purpose  
- Conduct focus-group testing on current design  
- Validate design concept | - Conduct 10 focused group testing on current design  
- conduct 30 focused group testing on following design |
| 2. Conduct trials in clinics and develop business plan | - Partner with **Berkeley Kaiser Permanente** for trial purpose  
- Refine business plan and develop product sales strategy | - Conduct 50 trial testings in total with finalized design  
- Prepare financial projection plan and legal documents |
| 3. Commence negotiation with health insurance companies and sales to pharmacies | - Contact health insurance for further discussion  
- Contact local health management companies for sales | - Finish 10 discussions with different health insurance companies  
- Establish first 100 product launch |
Moving *forward*?
Fine-tune current design based on further interviews.

Reach out to Berkeley Elder Care Program for testing.

Contact health insurance companies to discuss insurance coverage and house infusion therapy pharmacies to explore sales volume.
Appendix
Appendix: Research Summary | Insights

Dr Pedro Rivas

Peripheral or central veins
Peripheral veins are mostly restricted to arms, legs could impede motion
Usually on the opposite hand of the main use arm
Wrist access is used the most, the one in elbow is limited because people bend their arm
Problem Peripheral - short lasting, the endothelium of peripheral veins can have reaction with medications. This happens within days.
Central lines are more complicated to place (ultrasound needed), more prone to infections
These can be in the jugular or subclavian
Recommended onto backpack, big one
Long term IV fluids

Arielle

One bag was modified for flow rate using another bag filled with air (pressure)
Weak in manipulating pole - control should be accessible for user

Others

- Flows 15 drop/cc, 60 drop/cc. Calc = Volume to be administered x drop rate / target time
- Alternative - use of infusion pump
- Person might be too weak to carry design on herself (maybe reframe backpack)
- Detachment concern on patient, maybe incorporate a lock
- Pressure is enough to push fluid
### IV Bags Variety

<table>
<thead>
<tr>
<th></th>
<th>Type 1</th>
<th>Type 2</th>
<th>Type 3</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>Soft plastic</td>
<td>Hard plastic</td>
<td>Glass</td>
<td>It depends on the chemical characteristic of the medicine in the IV bag.</td>
</tr>
<tr>
<td>Volume</td>
<td>100ml</td>
<td>500ml</td>
<td>1000ml</td>
<td>The most common one is 500ml.</td>
</tr>
<tr>
<td>IV flow</td>
<td>15 drop/cc</td>
<td>60 drop/cc</td>
<td>other (control by pump)</td>
<td>It depends on the prescription of the doctor to adjust the flow speed.</td>
</tr>
</tbody>
</table>

Note that the column attributes are independent to types.
IV Bag Material

Hard Plastic  Soft Plastic  Glass Bottle
IV Treatment Process (nurses’ journey map)

1. Receive prescription
2. Get the IV bag
3. Hang the IV bag on IV pole
4. Attach IV set to IV bag
5. Adjust flow through watching drops in drop room
6. Injection
7. Attach IV set to IV bag
IV Set Selection

IV set selection: based on the doctor’s prescription whether the patient needs addition medicine to be added into the IV bag. If so, 60 (drop/ml) set would be adopted. Or if the patient needs instant IV treatment, 15 (drop/ml) would be adopted as it provides faster flow of IV.
<table>
<thead>
<tr>
<th>Target Users</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nurses + Doctors</strong></td>
<td><strong>Patients</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>product set up</th>
<th>role</th>
<th>product beneficent</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant pressure &amp; flow insurance free from location</td>
<td>likes</td>
<td>short distance mobility</td>
</tr>
<tr>
<td>the tangle of the IV set the flow &amp; pressure control</td>
<td>concerns</td>
<td>the weight of the IV bag the carrying method</td>
</tr>
</tbody>
</table>
IV Flow Calculation

- 2 types of IV set:
  - 15 drop/ml
  - 60 drop/ml (“sophisticated bag”)
- Prescription: 500ml for 3 hours

\[
\frac{500 \text{ (ml)} \times 15 \text{ (drop/ml)}}{[3 \text{ (hr)} \times 60 \text{ (min/hr)} \times 60 \text{ (sec/min)}} = 0.69 \text{ (drop/sec)}
\]

\[
\approx 2 \text{ drop in 3 sec}
\]

Then the nurse will check the drop room to adjust the flow.
**CONCEPT | User Case**

Prescription: **500ml for 3 hours**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Environment</th>
<th>Interaction</th>
<th>Object</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking at home</td>
<td>Kitchen at home</td>
<td>Carry IV bag on Koala-like belt</td>
<td>A military bottle-like bag for IV bag</td>
<td>Elders taking home infusion therapy</td>
</tr>
</tbody>
</table>
Target Users | Insights

- This would have its biggest impact in users that **stay at home**, for users in hospitals have very limited mobility due to weakness and restrictions from their situation.

- The solution **should not be a burden** to the user, it should be seamless and comfortable.

- Current products use infusion pumps, but they are **too large**.

- A lot of the cutting of the flow occurs at the very **entry of the vein**, once it is bent.

- The IV line **tends to tangle with users limbs**, which is one of the reasons why veins of arms are used over veins in the legs.
Free both hands from carrying the IV bag.

Prevent the IV set from tangling.

Check the residual fluid in IV bag.

Stabilize the vein entry end.

Be aesthetic.
- Ease of set up and replacement
- Reliable
- Remove gravitational component
- Seamless, easy to carry
- Transparent lid to see bag label
- Trigger message when fluid is running low
“… what is the pressure output?”

“… will it be too heavy to carry?”

“… the IV set could be tangled to the patient …”

“… I think the patient could drop the needle…”

Be aesthetic.

Ensure constant pressure output.

Be lightweight.

Sort the IV set.

Stabilize the vein entry end.
Overview | IV Access Points

- Seamless, easy to carry

Central
Peripheral
Arm Strap
Market | Home Infusion Industry Overview

- Expanding patient population
- Increasing penetration of home and alternate side infusion services

35% potential market share; estimated revenue at $2,280/patient.

Source: Harris Williams&Co Equity and Market Research
US home infusion therapy market size = $9 billion

Predicted market growth in 2018 = 38%

Potential market share = 35%

Assumed percentage of target user = 50%

Estimated share in revenue = 10%

Estimated market for IV bag = $172.5 million
Market | IV Pole Pricing in Market

Source: google shopping (top 20 pages)
Pole-free
GoGo IV
JULIFUL
Koala Carry
mobile IV
MOVILIV