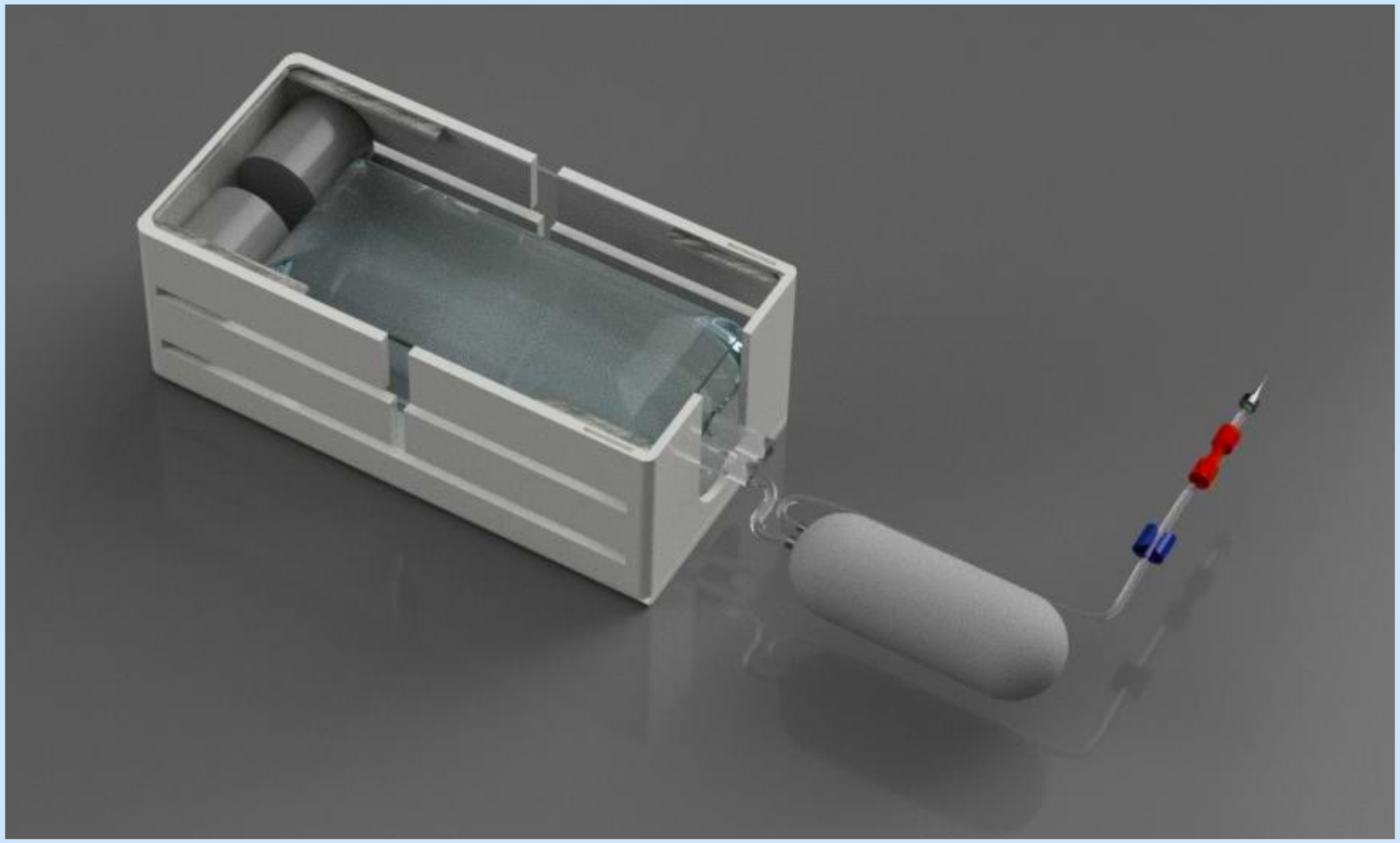


OSAA Collider

Diego | Yen - An

Moviliv

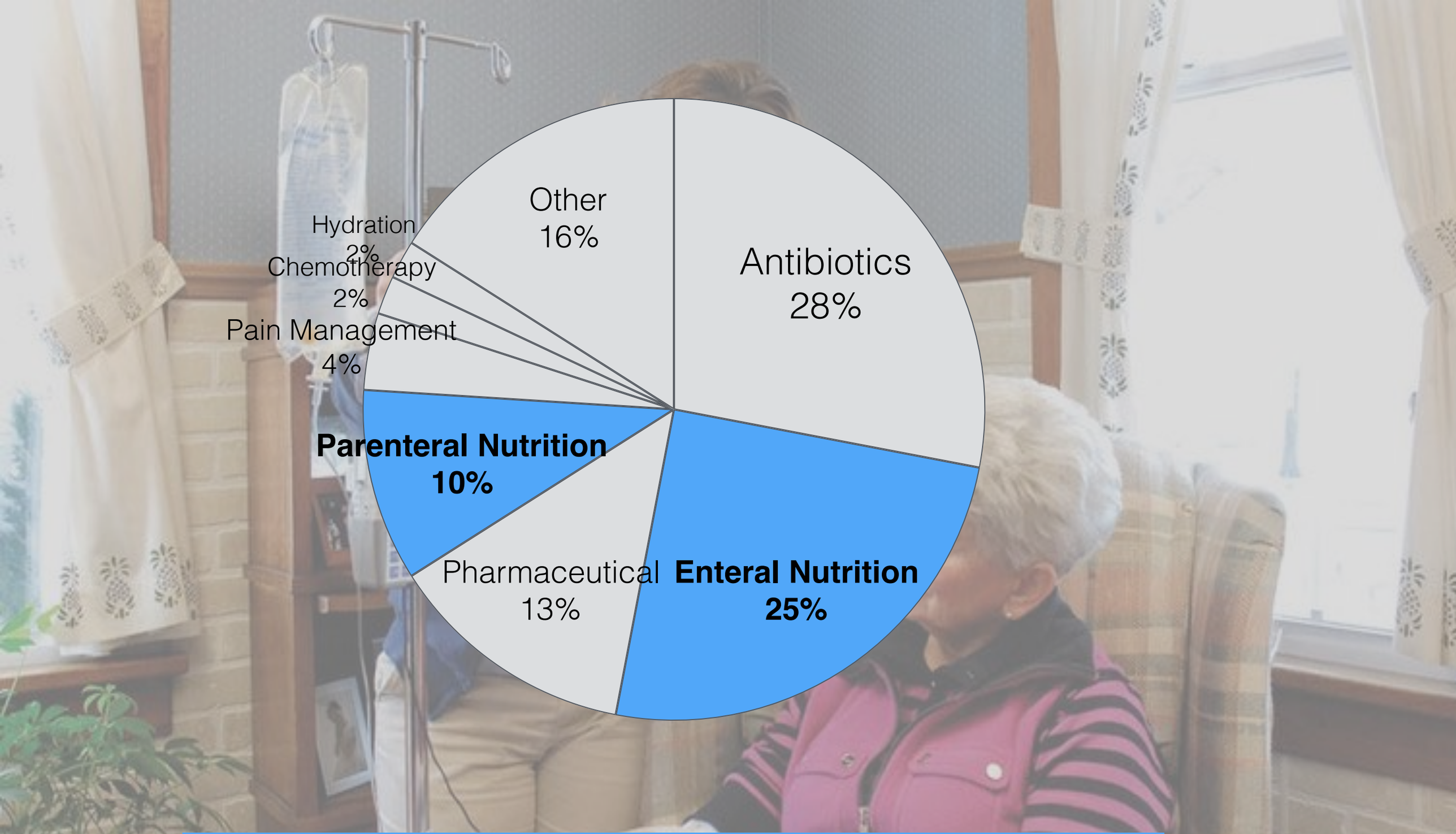
Who are we designing for?

Usually carry a 2-3 liter IV bag

The buy IV pole

Stay at home

Jane , 65+, Retired,
Home Infusion Therapy (Parenteral Nutrition)



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”

Elder Users

simple

light

seamless

Elder Users

“ .. a common problem is the flow is cut into the vein..”

“ .. I’m worried patients’ IV set will tangle..”

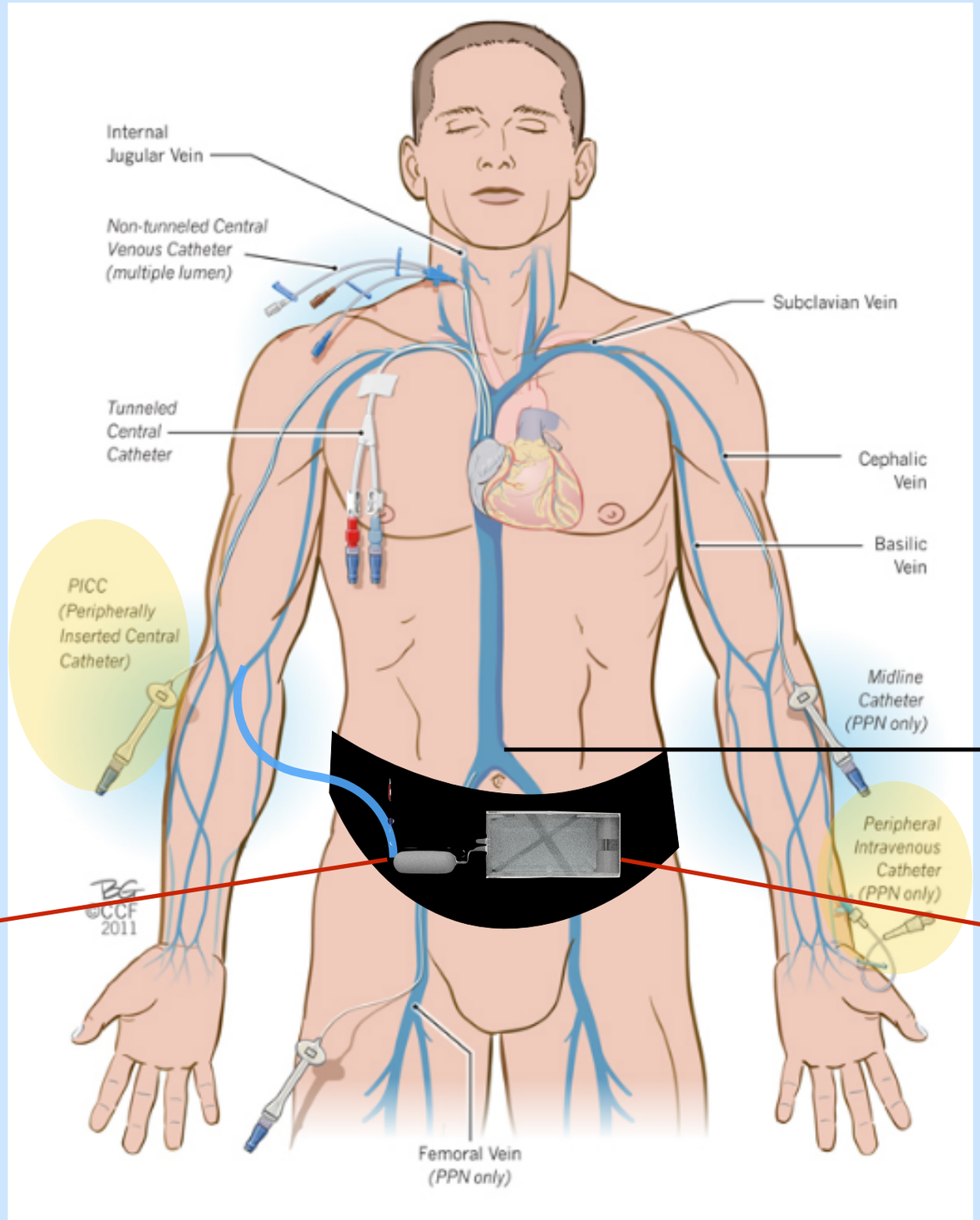
“ .. you have to make sure pressure is constant on its own..”

Nurses + Doctors

What is the **design**?

Overview | IV Access Points

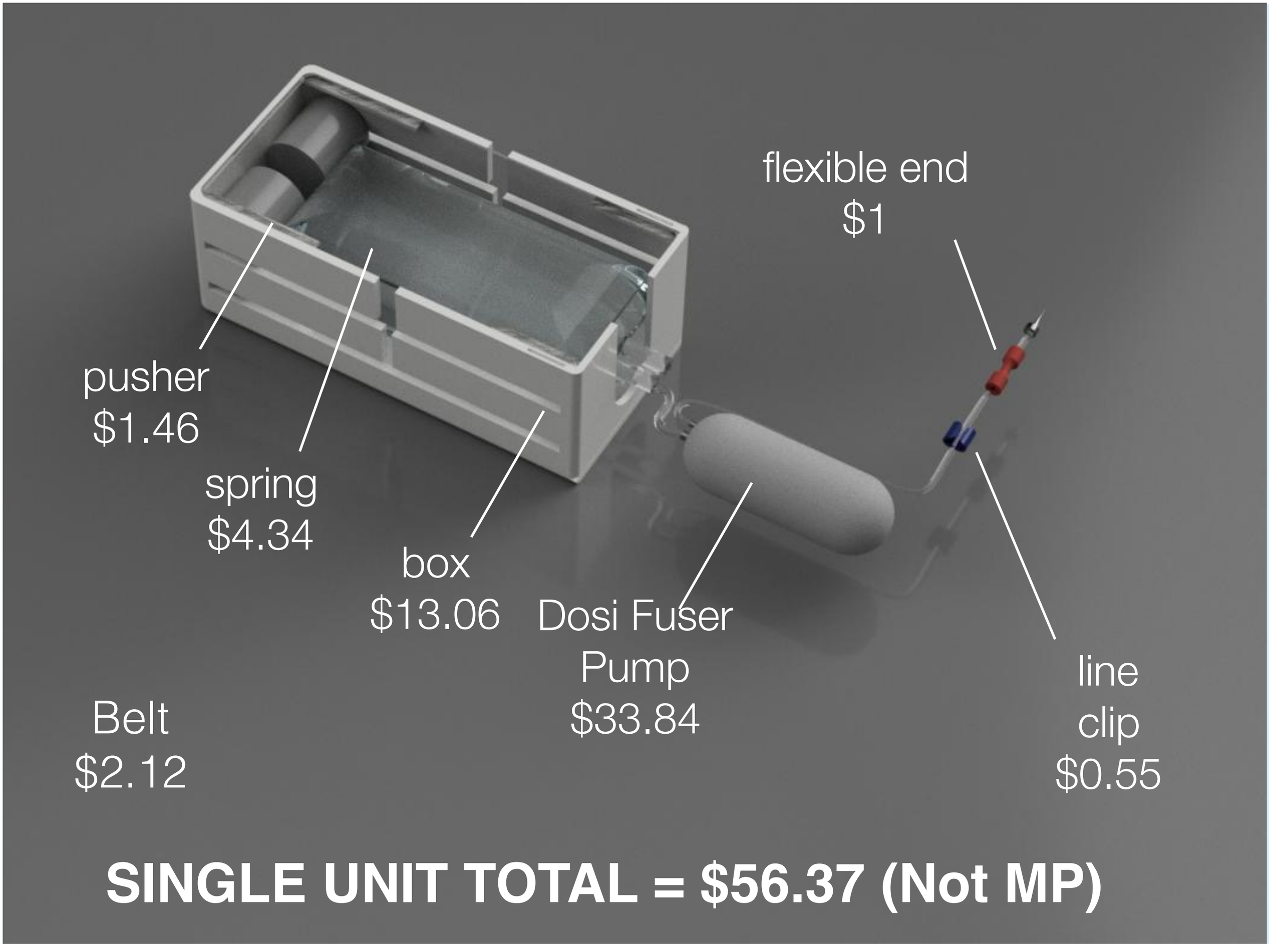
MOVILIV BELT



pump

MOVILIV

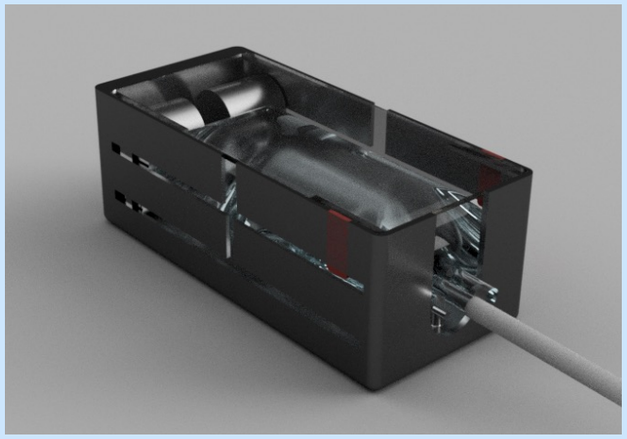
Principles of Nutrition Support - Kirby et al (2013)

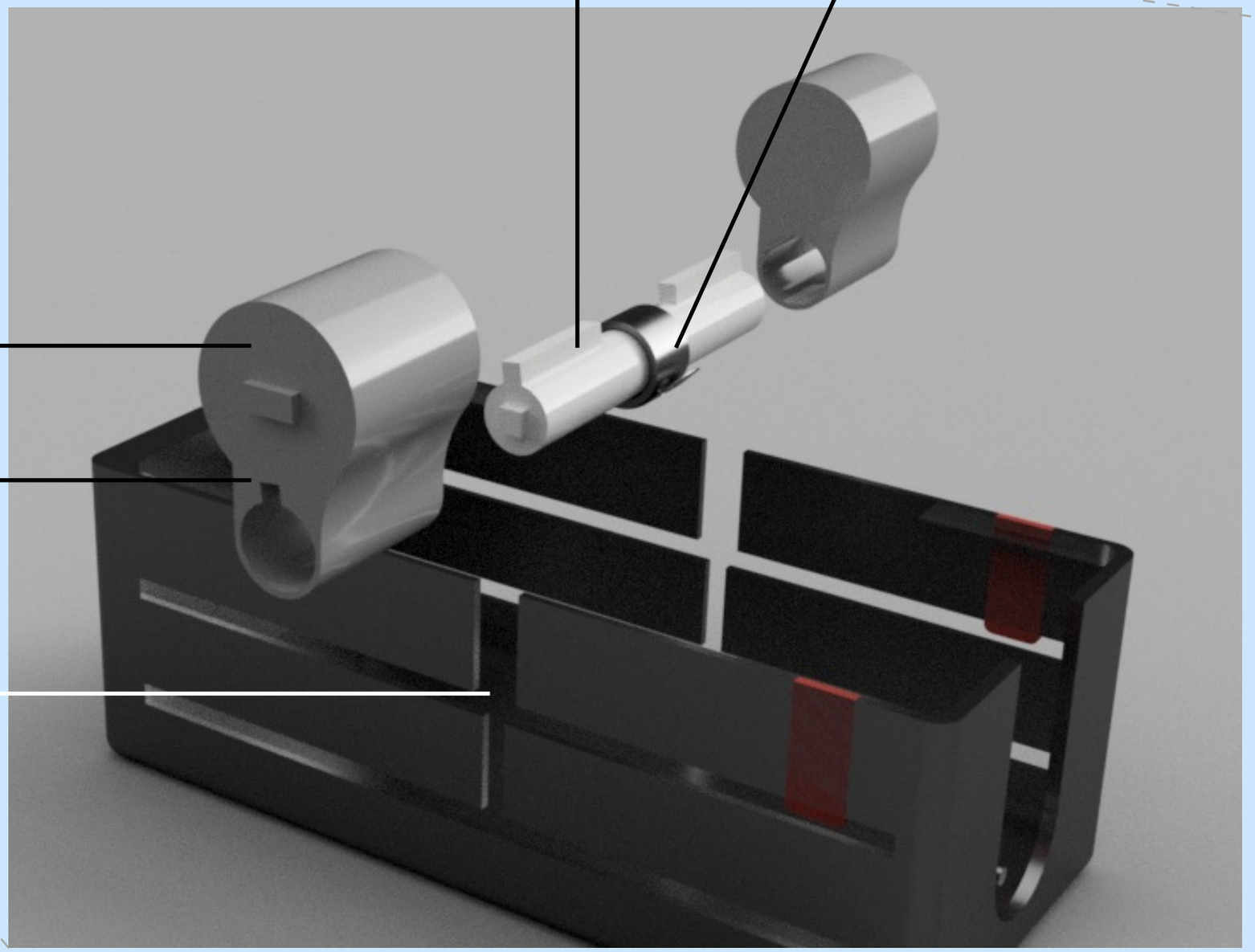


SINGLE UNIT TOTAL = $56.37 (Not MP)

But wait, **how** does it work?

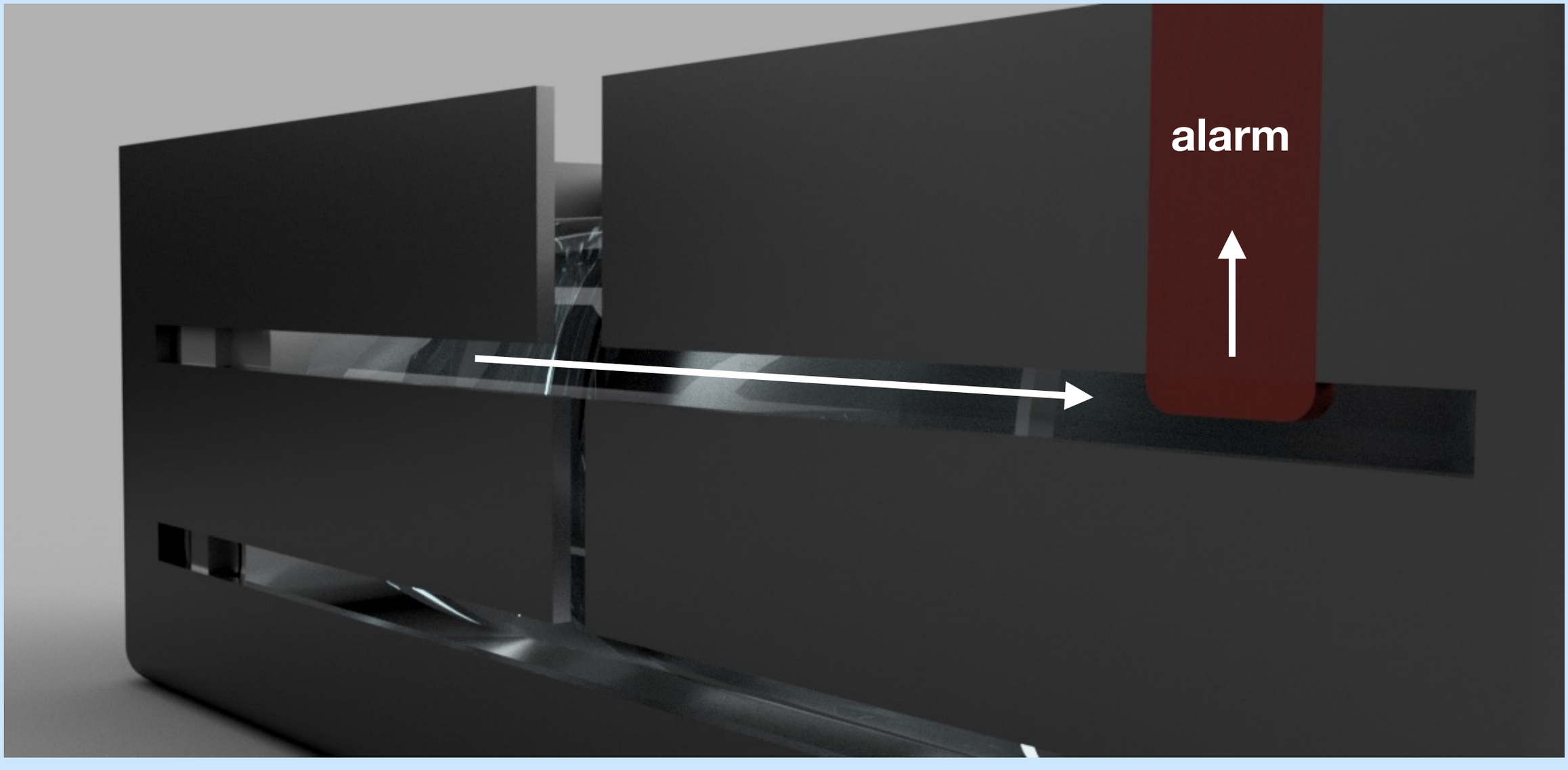
The Box | Design





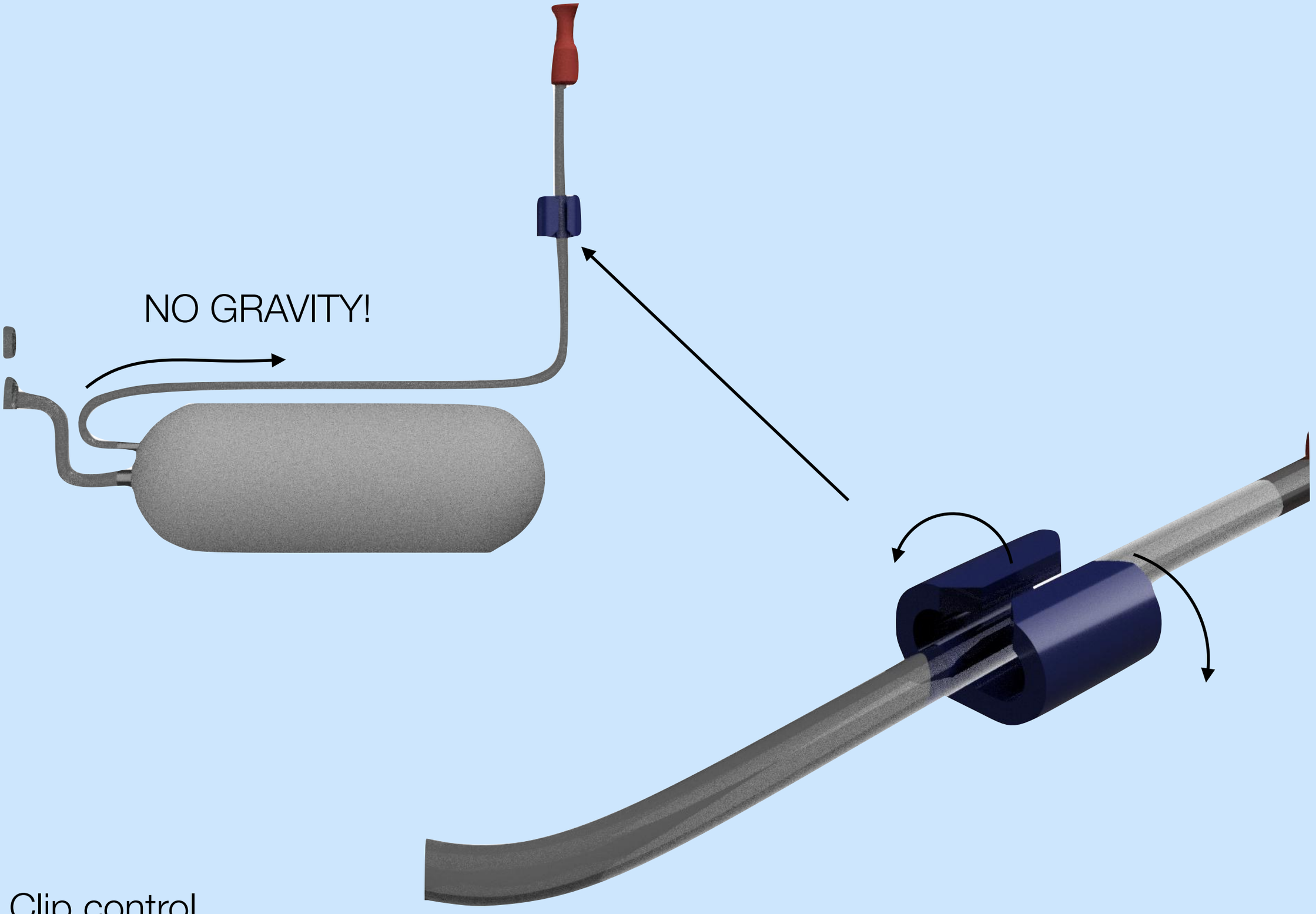
Ease of set up and replacement

Alarm | Design



Trigger message when fluid is running low

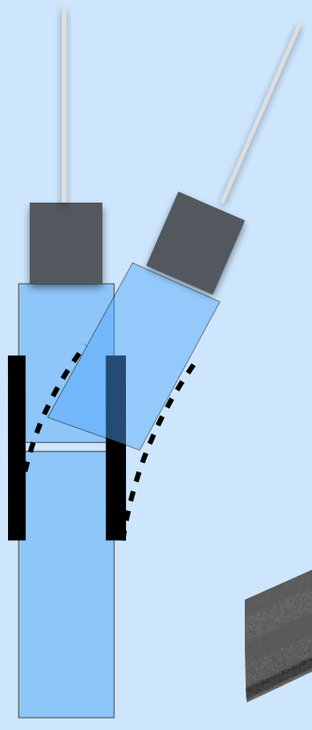
Line Control | Design



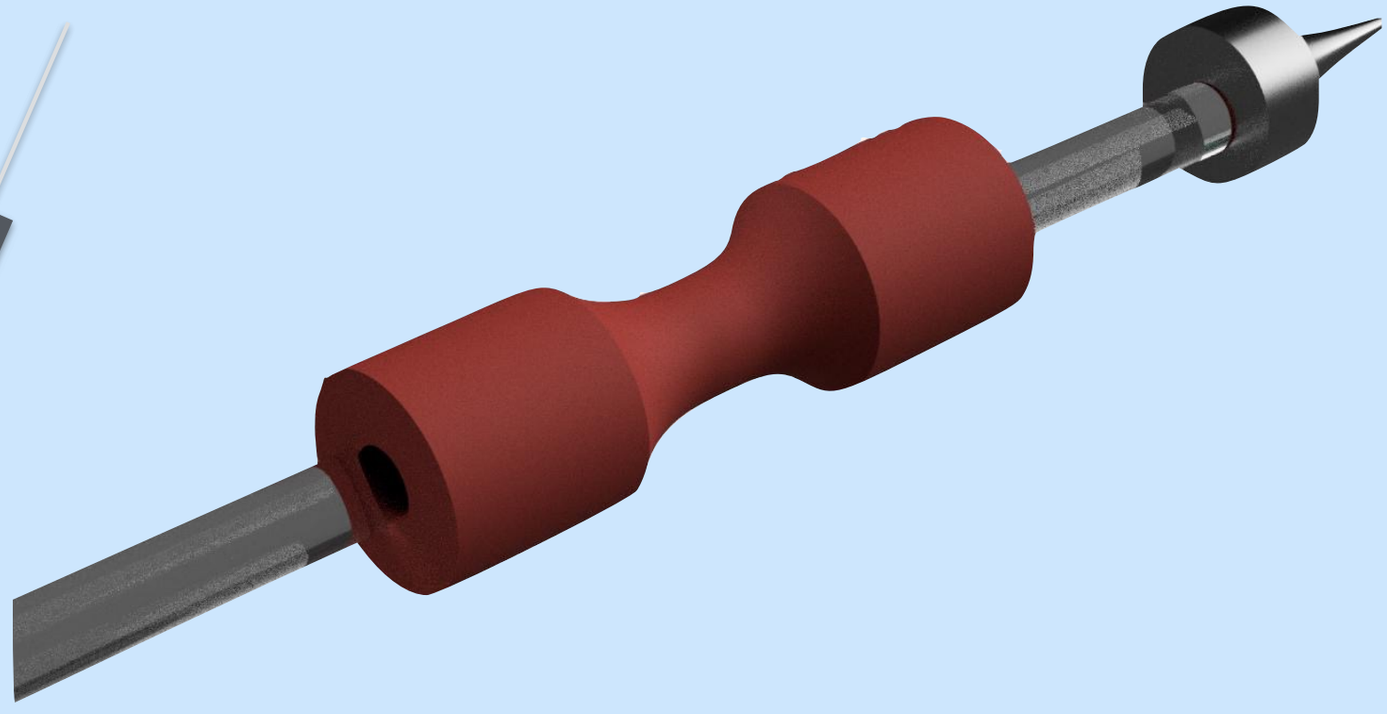
Clip control

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

Strategies	Initiatives	Measures
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**?

Next Step

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.**

Thank you!

Diego | Yen - An

Scope Definition

↓

Interviews + Observations

↓

Insights

↓

Design Principles

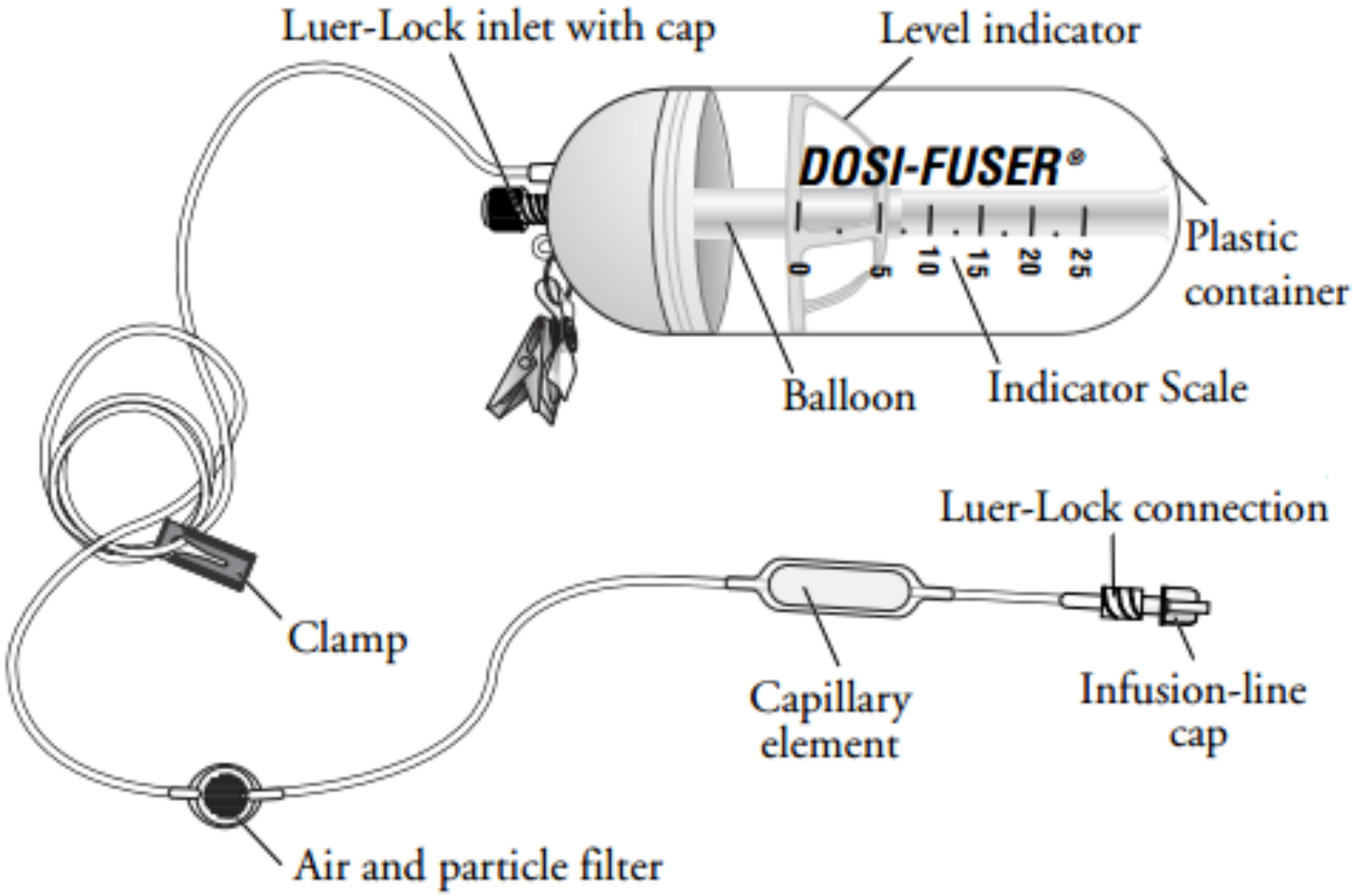
↓

Solution

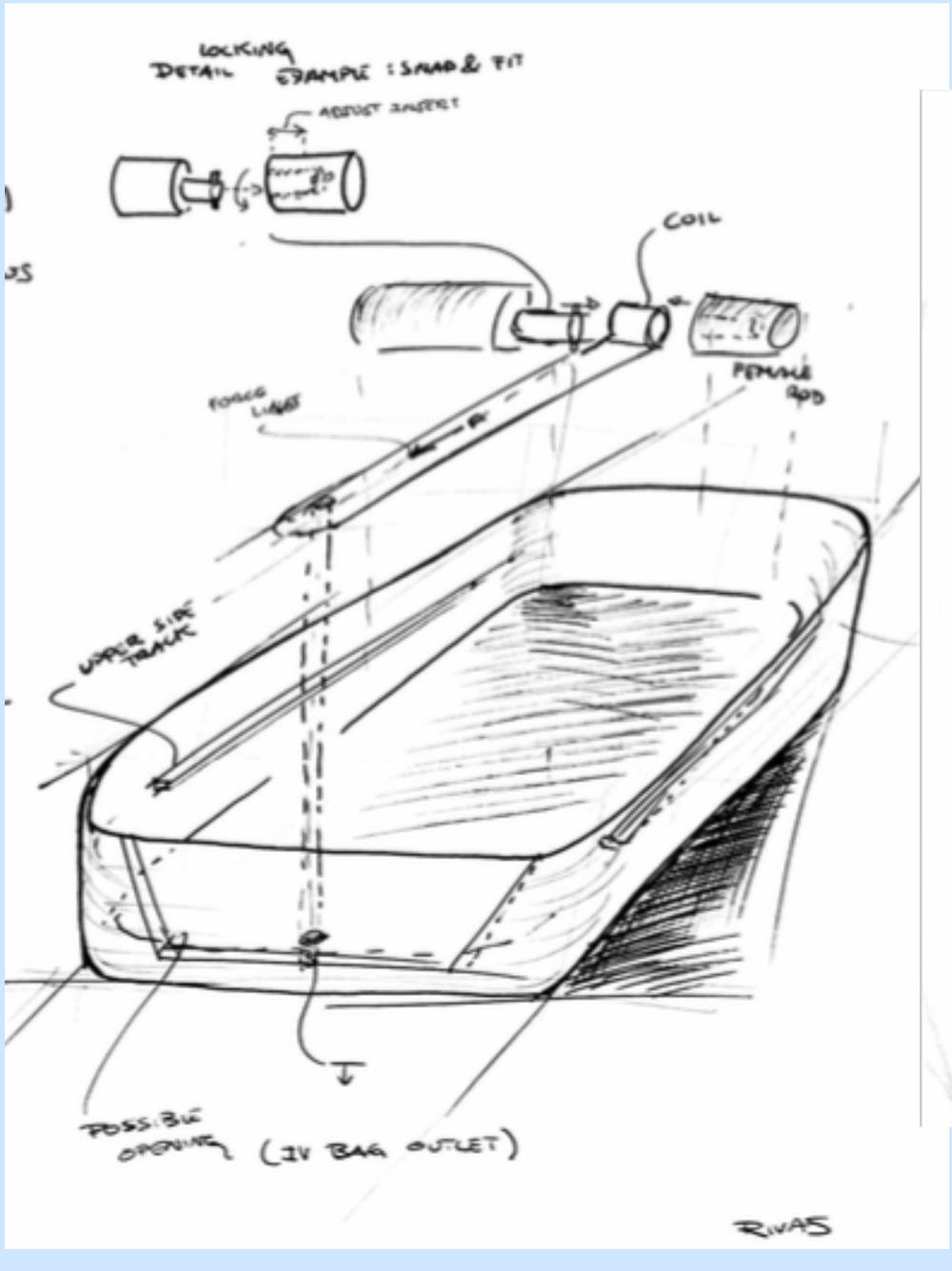
↓

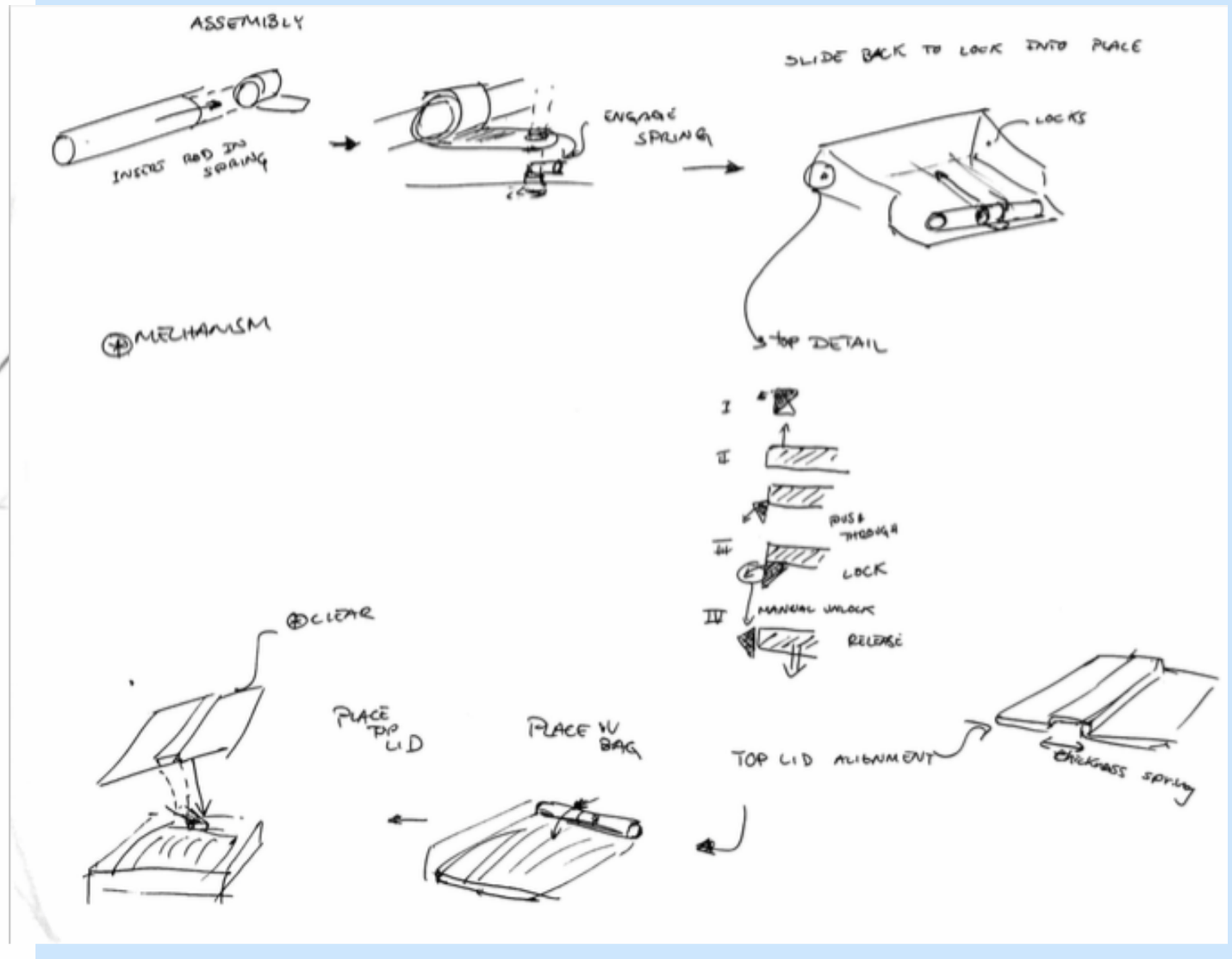
Testing

Appendix


Luer-Lock inlet with cap
Level indicator
DOSI-FUSER®
0
5
10
15
20
25
Plastic container
Balloon
Indicator Scale
Luer-Lock connection
Clamp
Capillary element
Infusion-line cap
Air and particle filter

The Box | Concept Sketches





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

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

Note that the column attributes are independent to types.

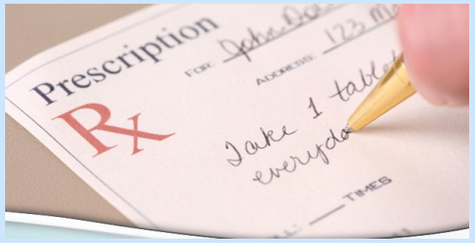
IV Bag Material

Hard Plastic

Soft Plastic

Glass Bottle

IV Treatment Process (nurses' journey map)



Receive prescription

Get the IV bag

Hang the IV bag on IV pole

Attach IV set to IV bag

Adjust flow through watching drops in drop room

Injection

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.

Target Users | Overview

Nurses + Doctors

Patients

product set up	**role**	product beneficent
constant pressure & flow insurance free from location	**likes**	short distance mobility
the tangle of the IV set the flow & pressure control	**concerns**	the weight of the IV bag the carrying method

IV Flow Calculation

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

500 (ml) * 15 (drop/ml) / [3 (hr) * 60 (min/hr) * 60 (sec/min)

= 0.69 (drop/sec)

≒ 2 drop in 3 sec

Then the nurse will check the drop room to adjust the flow.

CONCEPT | User Case

Prescription: 500ml for 3 hours




Activity	Environment	Interaction	Object	User
Cooking at home	Kitchen at home	Carry IV bag on Koala-like belt	A military bottle-like bag for IV bag	Elders taking home infusion therapy

EXPERIENCE

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.

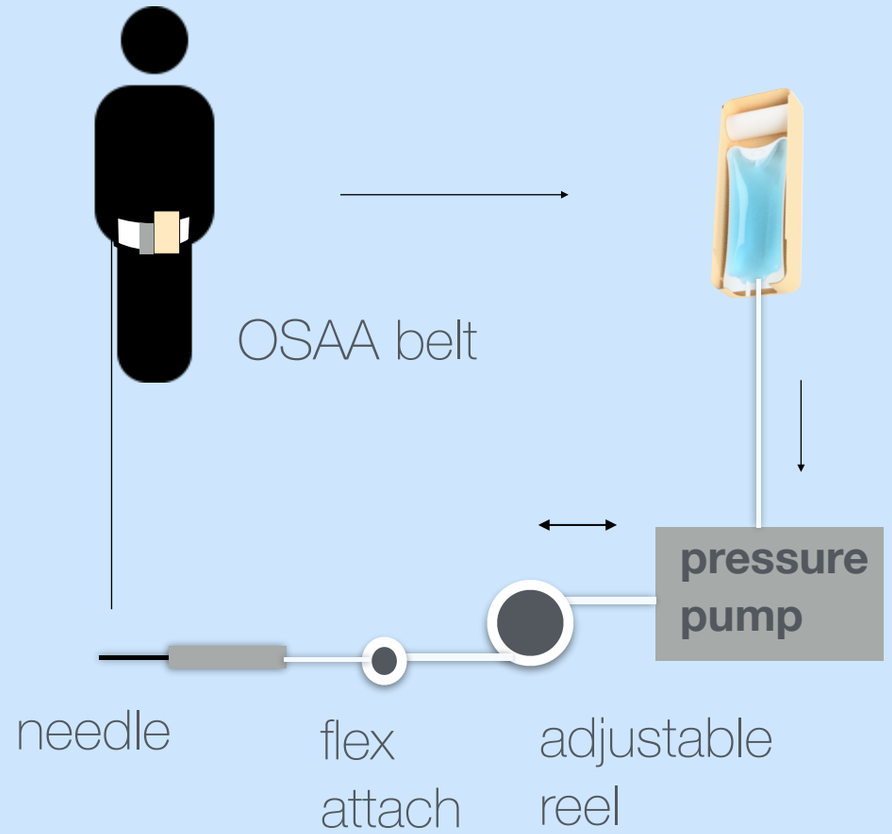
Check the residual fluid in IV bag.

Stabilize the vein entry end.

Be aesthetic.

Design Principles | OSAA

- 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.

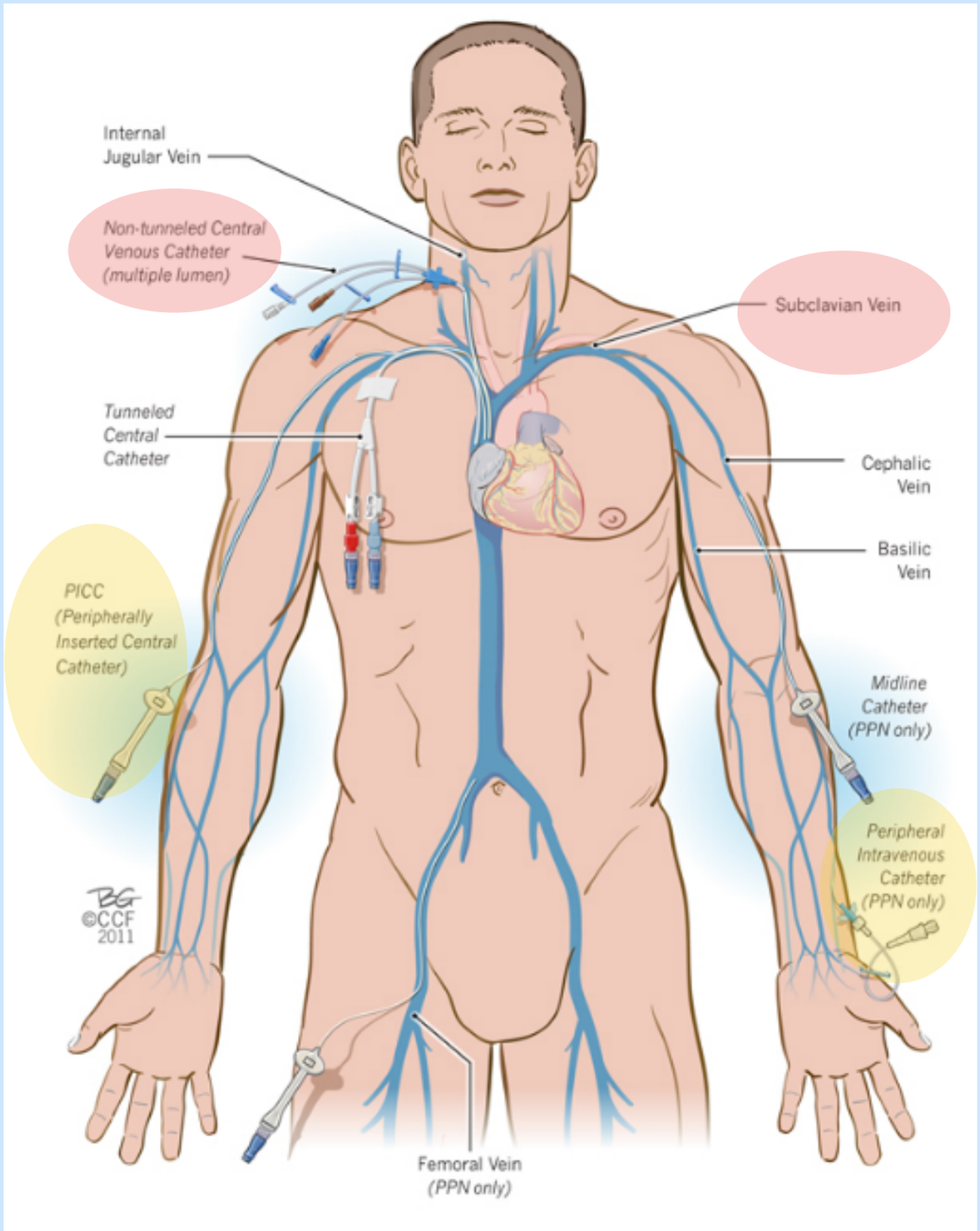
Be lightweight.

Sort the IV set.

Stabilize the vein entry end.

Overview | IV Access Points

- Central
- **Peripheral**

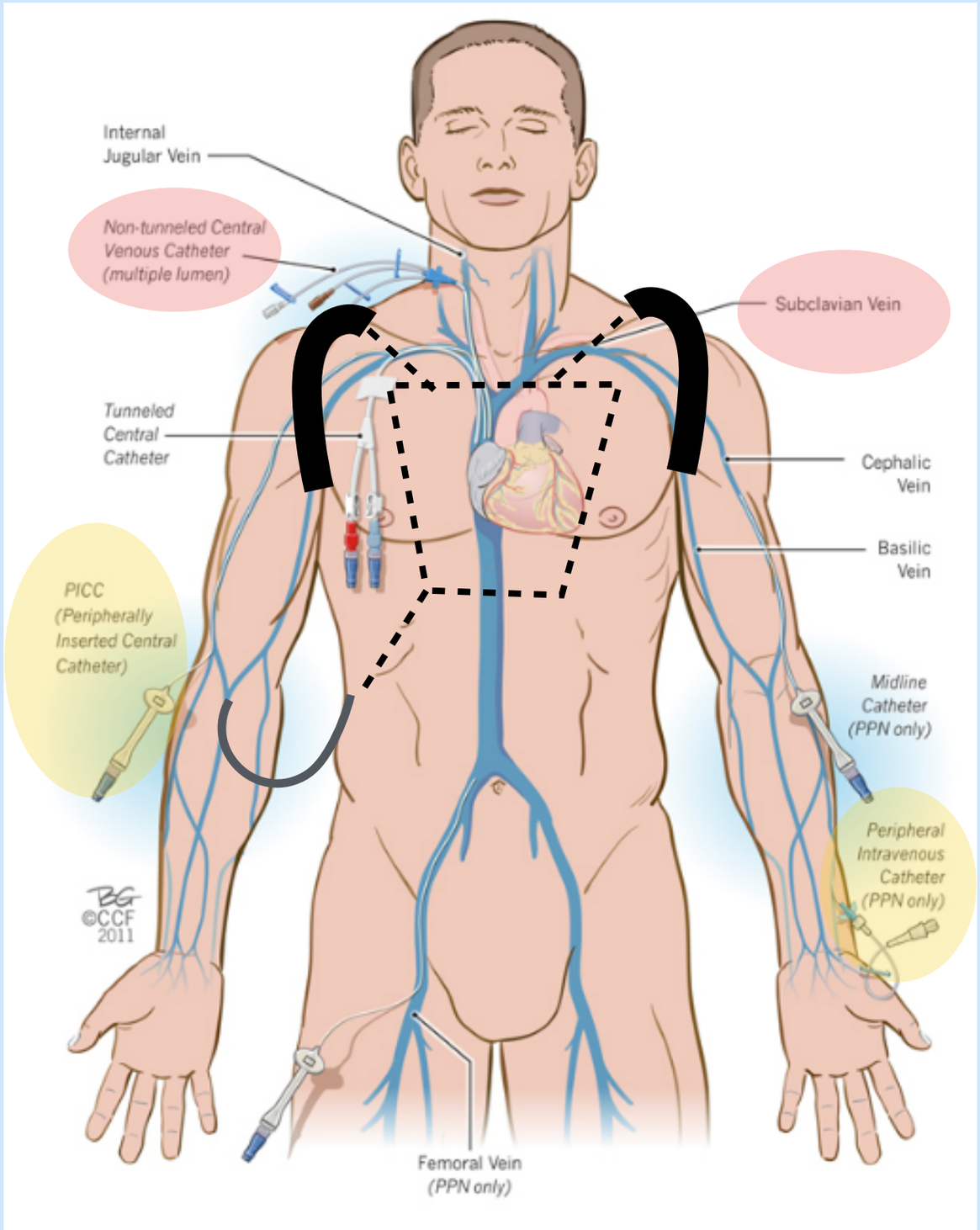


- Seamless , easy to carry

Principles of Nutrition Support - Kirby et al (2013)

Overview | IV Access Points

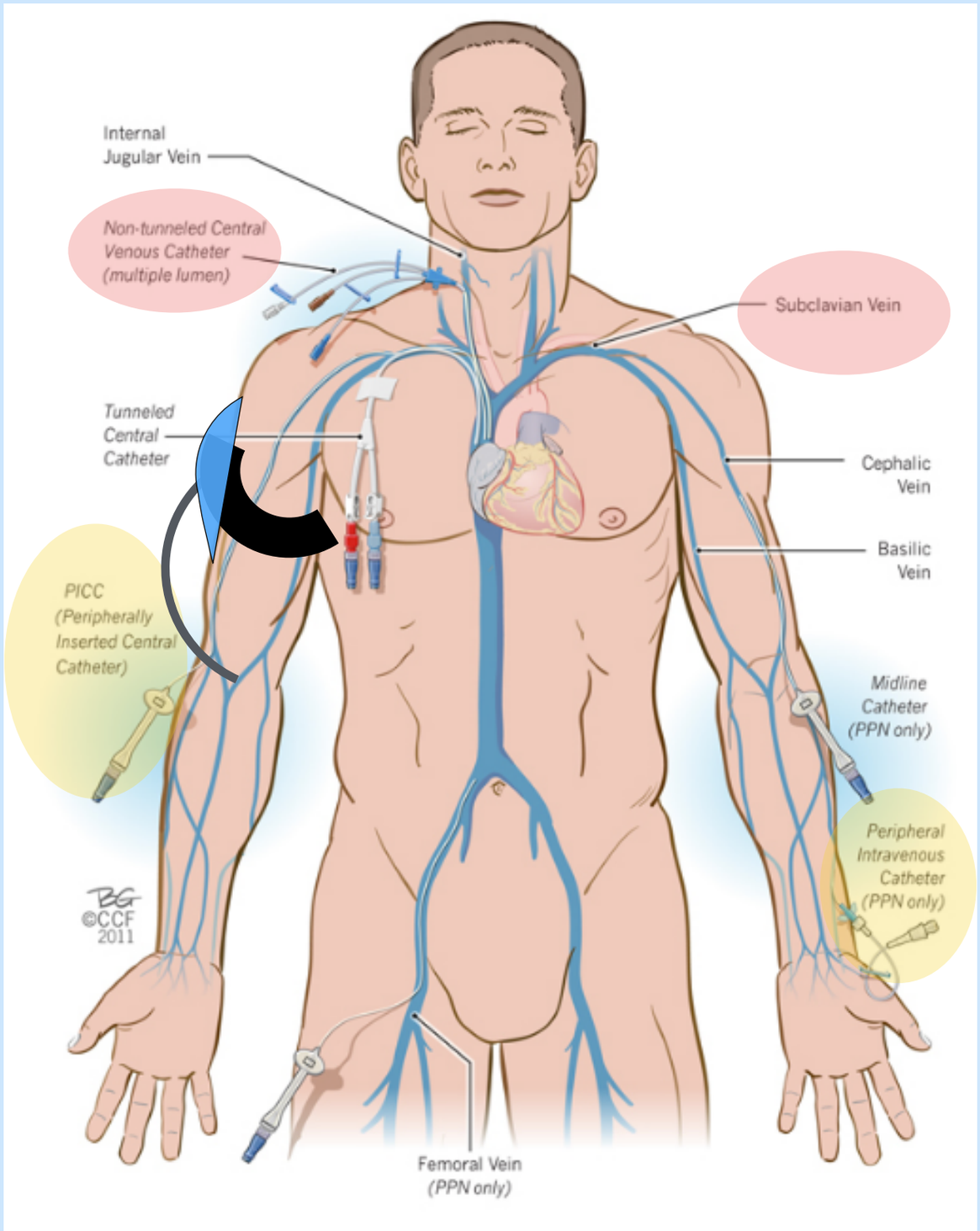
Back Pack



Principles of Nutrition Support - Kirby et al (2013)

Overview | IV Access Points

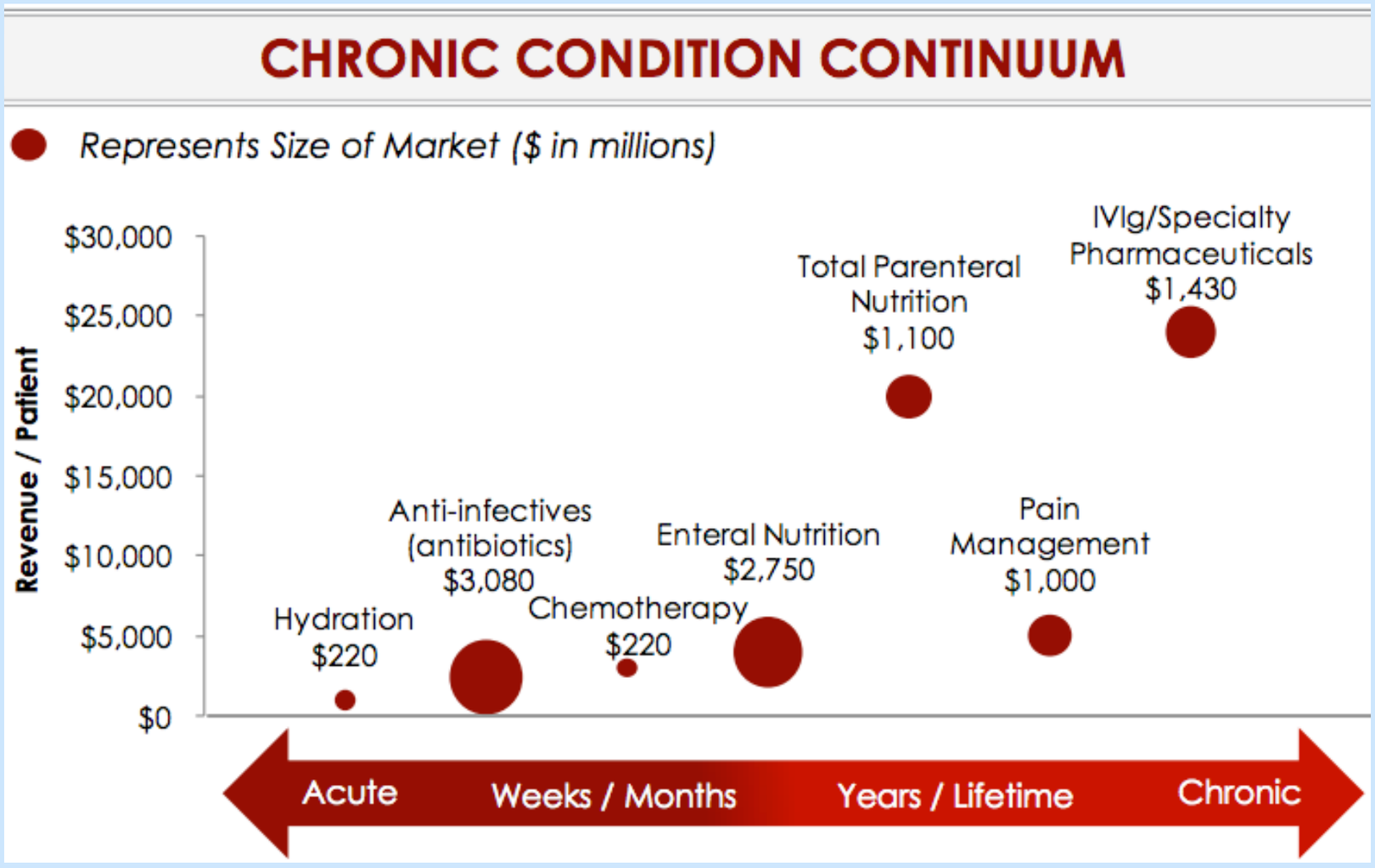
Arm Strap



Principles of Nutrition Support - Kirby et al (2013)

Market | Home Infusion Industry Overview

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



Source: Harris Williams&Co Equity and Market Research

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

BUSINESS | Market Size

US home infusion therapy market size = $9 billion

Predicted market growth in 2018 = 38%

Potential market share = 35%

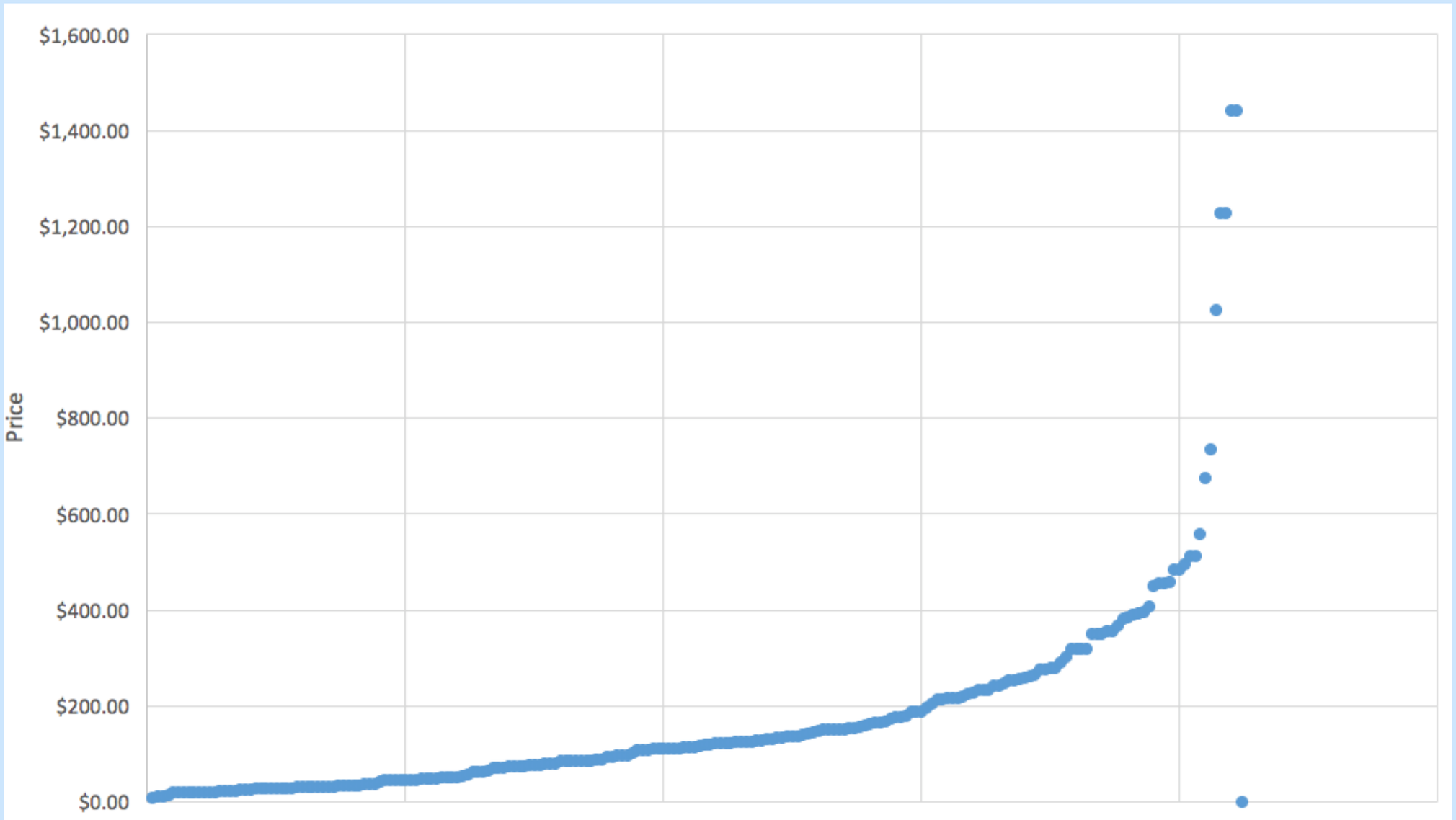
Assumed percentage of target user = 50%

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)

Business | Benchmark

Pole-free

GoGo IV

JULIFUL

Koala Carry

mobile IV

MOVILIV