

# SimPill

Hand-Held Pill Dispenser



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# Meet the Design Team



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Materials Engineering  
Design Pragmatist



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Mechanical Engineering  
Mechanical Engineering  
Research and design



**Travis Sears**  
Mechanical Engineering  
Design Lead



**Gavin Doster**  
Nuclear Engineering



**Blake Basil**  
Professional Flight  
Presentation lead



# POV Statement:



Millions of people deal with polypharmacy (taking 5+ medications daily). A significant amount of these same people also have complications such as arthritis. They need an easy way to dispense their pills into their organizers or hands so that it does not require fine motor skills.

## Stakeholder 1:

### Elderly/polypharmacy patients

- Most frequent users of medication (often taking 5+ medications)

## Stakeholder 2: Caregivers

- Often responsible to organize pills for patients

## Throughout this project we interviewed 10 people including:

- Arthritis patients
- Nursing home caregiver
- Nurse
- Physical therapist
- Physicians assistant
- Polypharmacy patients

# Research



## Core Research

Our problem is backed up by a paper written in 2007 that states 10% to 32% of elderly were unable to open certain types of bottle caps.

After reading this, we decided to create a bottle that negates the need to undo the cap very often.

## Visual Aid

- Researched visual aids on medicine bottles.
- Colors and symbols improve quick understanding.
- Visual aids increased users' ability to identify pills.
- Improved retention (remembering what each pill was for).

## Grip and Arthritis

- Researched fat-grip toothbrush
- Helped elderly people hold on while brushing
- We realized wanted to make something to help grip

**"I liked how large the button is, I think it's very clear what needs to be pressed and makes it obvious and accessible" -Pharmacy technician**

# Existing Solutions



## Hero Smart Dispenser

- Very expensive



## MedReady Automatic Pill Dispenser

- Requires manual refilling
- Small pill capacity



## Pillzar Portable Pill Dispenser

- Requires manual refilling
- Even smaller pill capacity



# How SimPill is Different



## Affordable

The SimPill device costs less than \$5 to produce and could be sold at \$8.50 for the base device. Making it more affordable for elderly people with limi



## Integrates with existing routines

SimPill integrates with existing routines by simplifying an existing task- organizing/dispensing medicine.

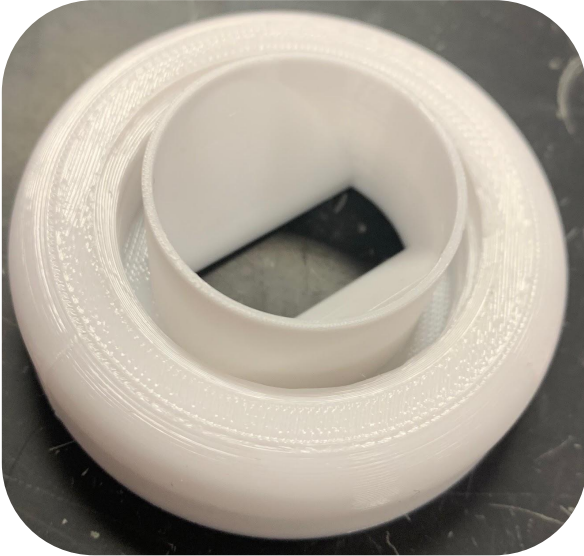


## Restores dignity

SimPill restores dignity by allowing users who may have lost the ability to sort their own pills due to disabilities like arthritis to dispense pills without pain.

# Design Features

## Entry Funnel



**SimPill**



## Pill storage

The bottle that SimPill attaches to is the storage

## Pill funnel

This directs the pills into the sorting chamber

# Design Features

 **SimPill**



## Pill Button

Allows the user to dispense one pill. Can be exchanged to fit different pill shapes.



## Locking switch

- Reduces humidity exposure
- Prevents accidental pill dispenses



## Height Selector

- Allows device to work with multiple pill thicknesses
- Clicks in/out

# Physical Demonstration

## Judges:

- Hold button down and shake if pills are not dispensing.
- Jamming instructions labelled on back



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# Validation Testing



## SimPill Consistency

| Testers tried to dispense 10 pills | How many pills were dispensed? |
|------------------------------------|--------------------------------|
| Test 1                             | 6/10                           |
| Test 2                             | 8/10                           |
| Test 3                             | 8/10                           |
| Average                            | 76.7% success rate             |

## Pill Retention

| Testers shook the bottle as hard as they could for 20s | Did any pills come out? |
|--------------------------------------------------------|-------------------------|
| Test 1                                                 | No                      |
| Test 2                                                 | No                      |
| Test 3                                                 | No                      |

## Ease of Use

| Testers had no prior exposure and little instruction | How straightforward is use (1-Difficult, 5-Easy) |
|------------------------------------------------------|--------------------------------------------------|
| Person 1                                             | 5                                                |
| Person 2                                             | 4                                                |
| Person 3                                             | 4                                                |

# Implications If Successful

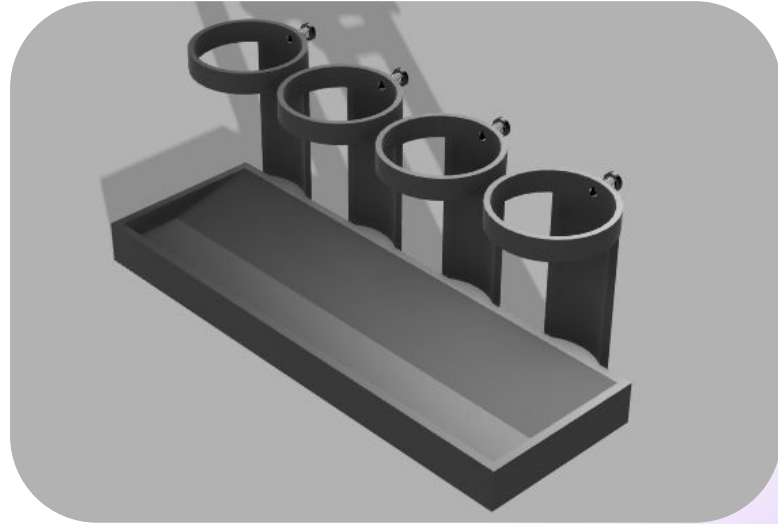
- Patients who were no longer able to sort their own medication regain the ability to organize and administer their doses safely.
- Caregivers are able to save time while organizing pills
- Keeps people safe by preventing spills; spills cause falls and injury
- Elderly people will take their medicine more consistently, keeping them healthy

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# Next Steps

- **Additional Features**
  - Easy loading funnel
  - Modular docking station
  - Silicon grip on base



# Next Steps

## - **Manufacturing Concerns**

- Material for a long lasting spring
- Clearance issues as we downsize for small pill bottles
- Move to injection molding for food safety

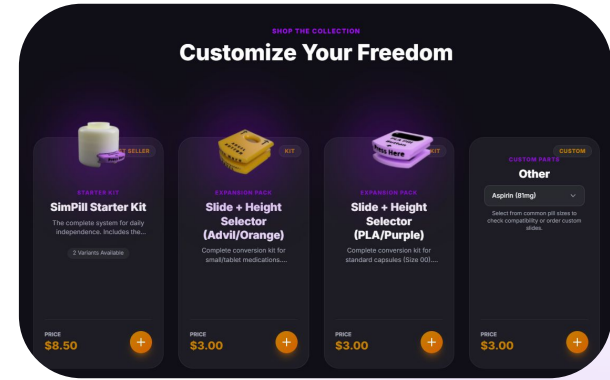
## - **Research Needed**

- Adapting to prescription bottles
- Affordable mold creation for various pill sizes



# Next Steps

- **Potential business model**
- SimPill device includes pill button and height selector for one pill
- Customers can order pill sizes not already in production, they would then be added to the library of pills.
- Bundles of multiple SimPill devices will be sold at a discounted rate (bulk shipments)



# Website Demo



# Bibliography

\* All sources APA formatted

## Existing Solutions:

All information taken from product websites:

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# SimPill

Thank you for  
listening!

