When analyzing the current state of medicinal packaging, there is plenty of variety but there are still some major issues. The Capsule is a handheld packaging device that focuses on easy access of medication for adults with low hand dexterity while keeping it safe and organized. Taking inspiration from other forms of product packaging, The Capsule does a good job embracing an alternative approach to medication while trying to stay consistent to familiar functionality of other handheld house objects.

Problem Statement

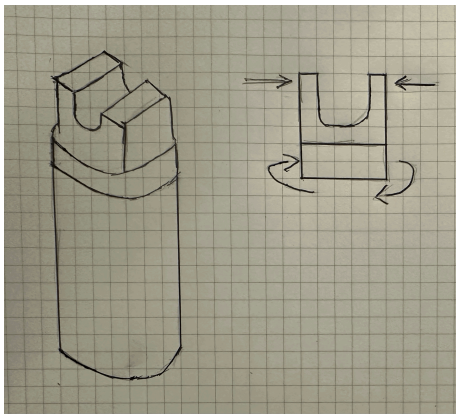
Throughout the project I maintained a focus on redesigning the process of opening the pill bottle. The current bottle packaging for pills focuses on a push down and twist method which has proved difficult for those who suffer from arthritis and low dexterity. About 53 million people in America suffer from some sort of arthritis, of which 85 percent have taken some sort of pill medication in the past year. With such a large pool of people who can potentially struggle with accessing their medication, we want to align the new design with familiar objects used on a daily basis, the main one being deodorant. So the following problem statement is what I used to design a product that can substitute for the current pill bottle:

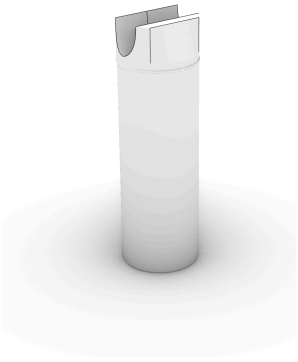
How can we create a pill bottle cap that maintains a child protective security measure while making it easier for elderly to access their medication?

Early design concept

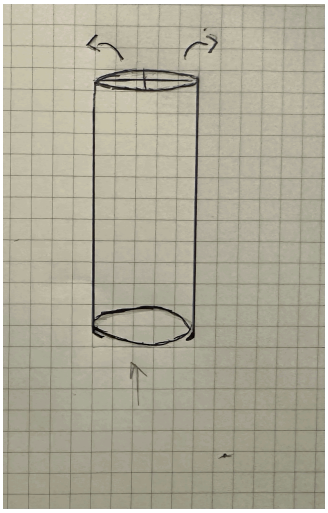
Early concepts of this project, I focused on trying to maintain a similar form to the current pill bottle. I attempted to redesign solely the cap so that it can be implemented into the

current system. The first design focused on a squeeze method, where both ends of the top must be pushed inward to release the latch for the bottle. The cap's size would have stayed consistent with current sizes of available pull bottles. While this design does make it easier to open, with a shorter amount of steps, it doesn't prove itself useful, when it comes to keeping children out.





The second idea I had, I wanted to hone in on the child safety aspect. Still maintaining the cylindrical shape of a pill bottle, The bottom layer of the bottle can be pushed vertically and as the floor raises, medication can be pushed and dispensed out the top. The top of the bottle can only open outward, limiting any physical touch to the pill until it exits the bottle. The key is the length of the tube, the tube needs to be long enough where the average length of a child's finger would not be long enough to push a pill all the way out but the average adult size can. This seemed like a good idea at the moment, but there were two key issues. The bottle would be designed based on average sizes of hands, meaning there are entire groups of people that would be excluded. Also, once a pill is dispensed, there is no logical way of putting the pill back let alone refilling the bottle, creating an unsustainable product.



Feedback

After presenting these ideas there were some critical points that I took advantage of for the next iteration. For starters, the acknowledgement of other forms of limitations to dexterity, a major one being those with arthritis. With the next iteration an emphasis on research for those who have that was critical. The second major point is in multi-step processes to open the bottle, with enough simple steps, a competent adult would be able to access their pill no problem but a child would struggle without proper instruction. Finally, with the next iteration, take inspiration

from other forms of packaging. The first design concept had a consistency with the current bottle that limited the potential of what medicine packing can look like. By utilizing forms of packaging, such as candies, deodorants, and other niche items, I can incorporate them into a new design.

Medication packaging

For this project I created two moodboard, both depicting different aspects that inspired the design of the Capsule. The first mood board focuses on different types of medication packaging. There are a plethora of alternative medication packing that each serve their own purposes and are useful for a given situation. Some of the most identifiable ones include the wallet, medicine box, and blister packaging.

Alternative packaging

This mood board focuses on alternative packaging outside of the medicinal world. A big inspiration I wanted to take into consideration is packaging that handles multiple units. Items such as gumball machines, fruit baskets, chips and more all show different methods to contain and distribute content. For the Capsule I still wanted to include a vertical moving motion so items such as deodorant played a pivotal role in the design of the capsule.

User statement

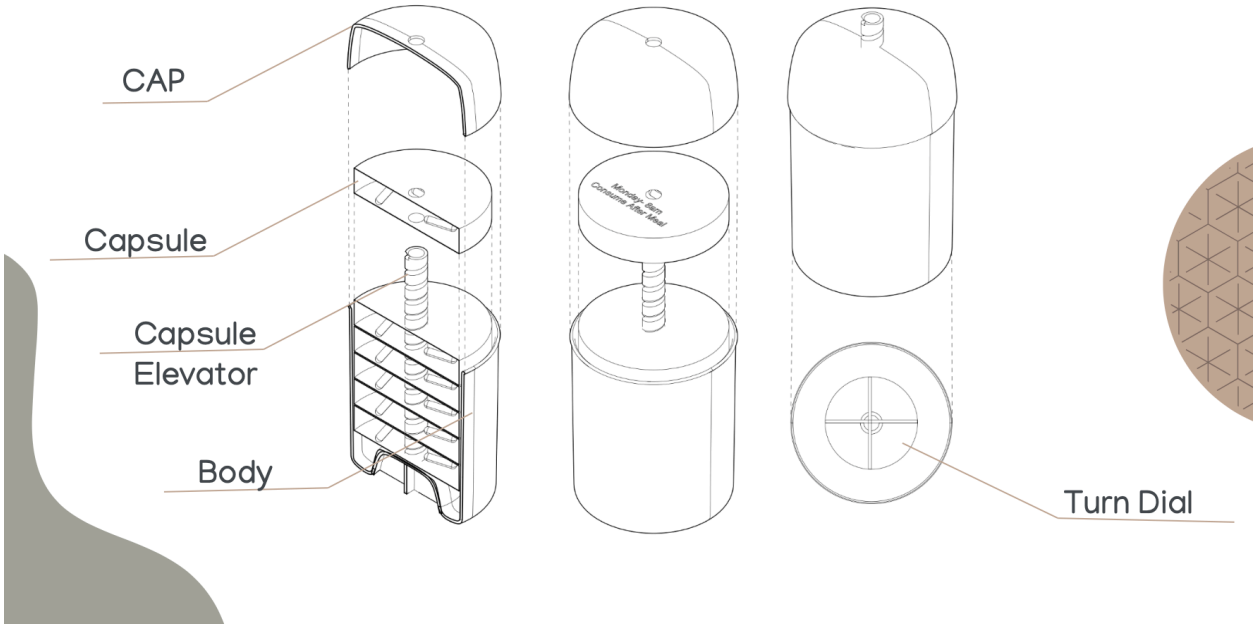
The Capsule needed to match certain criteria which would deem it successful for the user. With the current packaging focusing on keeping children out, it unintentionally creates a more difficult process for those who struggle with their dexterity to open their medication. The Capsule must focus on painting that child safety feature but make it easier to open your medication. The product is meant for people of older age so it should be made on a larger scale. The product also should accommodate users who change environments frequently, so it must be larger than the average hand of a child but small enough to be stored, travel friendly, and accessible during an emergency. Finally, with such a big issue with current pill bottles not being recyclable. There are plenty of users who take pills on a consistent basis over a long period of time so the product should be reusable so that our users can not only utilize a sustainable product but also create positive habits by switching there medication equipment.

Gender	Average hand length	Average hand breadth
Male	**6-year-olds:** 4.6–5.7 inches **11-year-olds:** 5.5–6.8 inches	**6-year-olds:** 2.1–2.6 inches **11-year-olds:** 2.0–3.1 inches
Female	**6-year-olds:** 4.4–5.7 inches **11-year-olds:** 5.6–7.0 inches	**6-year-olds:** 2.0–2.7 inches **11-year-olds:** 2.0–3.1 inches

The Capsule

The Capsule is a handheld packaging device that helps users organize their medication on a weekly basis while still maintaining child protective procedures. As seen below, the Capsule comes with multiple components that come together to make the product usable. The Capsule has an outer case that is used to store all of the interior capsules. These capsules each contain the correct dosages of that person's medication and on top of the capsule are times, dates, and instructions on when to take the medication. This would allow the user to keep track of what day or time they are on to take the medication. To access the capsule, I utilized a screw on mechanic. By Interacting with the turn dial located on the base of the body, the user can turn the dial clockwise and counter closways making each down go up and down respectively. Once the user has turned the dial enough the capsule that lays on the top of the stack will be released and the user can break the capsule open to take their meds.

The outer shell of The Capsule would be a one time purpose and be durable enough to be reusable for long periods of time. The capsules inside however would most likely be made of very lightweight material such as paper or cardboard, as once the seal on one is broken it must be disposed of. The focus is for the capsules to be made of a recyclable material to reduce waste. The user would coordinate with their pharmacy so that the pharmacy can provide weeks worth of capsules for the user and they can organize the capsules inside the case for clear organized use.



Competition

When analyzing the market for what kind of potential competition The Capsule would have, the one that stood out was the Pill Pack. The Pill Pack is a company that focuses on delivering organized and clearly legible medication to its users. It comes in a sustainable paper material and the medication comes in a roll of plastic which is divided into days for when you must take your meds. Each sector describes a time, date and instruction of how to take your meds giving the user clear steps to follow. Although this product is clearly useful, some issues include its over bearing size. The product is a stay at home product and does not serve well dore traveling. Not to mention, it does not incorporate any child safety features.

Next Steps

Following this last presentation, there are some key steps that need to be taken. For starters, creating my first real prototype is due. It is vital to get user data and I cannot do so without having a clear example of what my product is. The next big question is material. I was looking to stay consistent with the orange plastic for my outer shell but the capsules inside would need to be able to withstand moisture and other elemental factors. I would assume some sort of sealable plastic would serve as a sustainable and cost-effective solution.

Citations

1. "Child-Resistant Packaging." *Wiley Online Library*, vol. 12, no. 1, 1988, https://agsjournals.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1532-5415.1988.tb01812.x.
2. Hurst, N. "The Surprising Origins of Child-Proof Lids." *Mental Floss*, 23 Dec. 2015, https://www.mentalfloss.com/article/54410/surprising-origins-child-proof-lids.
3. "Child-Resistant Packaging." *Wikipedia*, en.wikipedia.org/wiki/Child-resistant_packaging. Accessed 13 Oct. 2024.
4. "Research Reveals Scale of Child-Proof Packaging Problems." *Outsourcing-Pharma*, 26 Apr. 2004, https://www.outsourcing-pharma.com/Article/2004/04/26/Research-reveals-scale-of-child-proof-packaging-problems.
5. "Arthritis." *Centers for Disease Control and Prevention*, www.cdc.gov/cdi/indicator-definitions/arthritis.html. Accessed 13 Oct. 2024.