EYE DROPPER ASSISTANT, BME 402

Date: 04/25/2024

Client: Dr. Beth Martin (<u>beth.martin@wisc.edu</u>)
Advisor: Tracy Puccinelli (tracy.puccinelli@wisc.edu)

Co-Team Leaders: Kasia Klotz (kmklotz@wisc.edu), Anabelle Olson (amolson27@wisc.edu)

Communicator: Eva Coughlin (emcoughlin@wisc.edu)

BPAG: Tommy Kriewaldt (tkriewaldt@wisc.edu)

BWIG: Jenna Krause (jlkrause4@wisc.edu)

BSAC: Tevis Linser (<u>linser@wisc.edu</u>)

Note: Team member Tommy is currently participating in a Co-Op and is devoting time to that position. Tommy will work on what he can this semester for the project but due to this conflicting commitment, his contributions *may* be limited.

Problem Statement

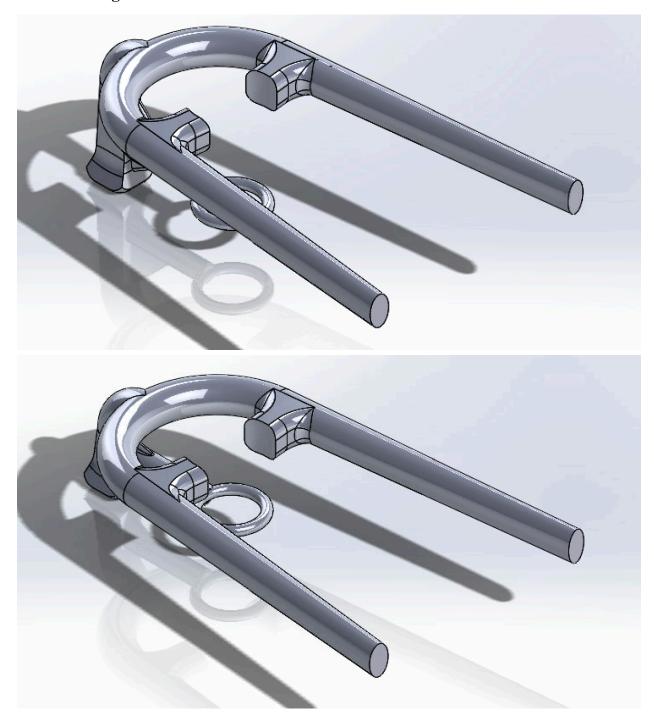
Administration of eye drops is difficult for patients, especially older adults and those with limiting diseases like arthritis. This results in eye drop waste and tip contamination. The team will design a device to assist patients in squeezing the eye drop bottle while releasing a consistent amount of solution per drop. This device will improve the administration of eye drops for the patient while minimizing eye drop waste.

Brief Status Update:

The team spent the week finalizing the poster and practicing for the poster presentations this Friday. Additionally, the team has finished all the aspects for the packaging.

Difficulties & Advice Requests: N/A

Current Design:



Design Changes:

- Nose piece removed and platform implemented for user to rest on eyebrow bone.
- Altered the squeezing mechanism to be more uniform for injection molding.
- Separated components to allow for less complex injection molding procedures.

Materials and Expenses:

| | | Manufacture | Part | | | Cost | | |
|---------------------|---------------------|--------------------------|----------------|---------|-----|-------|-------|-------------|
| Item | Description | r | Number | Date | QTY | Each | Total | Link |
| | | | Existing | Devices | | | | |
| Droppy Eye Drop | Competing | Droppy, | | | | | | |
| Dispenser | Design | Amazon | DR001 | 9/25 | 1 | 9.99 | 9.99 | <u>Link</u> |
| GentleDrop | | | ASIN: | | | | | |
| Eye Drop Guide | Competing Design | GentleDrop, Amazon | B0BQB HRKV1 | 9/25 | 1 | 17.99 | 17.99 | <u>Link</u> |
| | _ | | Protot | yping | | | | |
| | Prototype | | | | | | | |
| Silicone | Materials | PETUNIA | ASIN: | | | | | |
| Eyelash | (Handle | SKINCARE, | B00UVL | 10/25 | | 7.40 | 7.40 | |
| Curler | Grips) | Amazon | NDVQ | 10/25 | 1 | 7.49 | 7.49 | <u>Link</u> |
| | | UW | | | | | | |
| MakerSpace | | Makerspace Ultimaker 3D | | | | | | |
| Print | Prototype v1 | Print | N/A | 10/31 | 1 | 4.96 | 4.96 | N/A |
| | | UW | | | | | | |
| | | Makerspace | | | | | | |
| MakerSpace | D | Ultimaker 3D | | 11/10 | 4 | 5.07 | F 07 | N1 / A |
| Print | Prototype v2 | Print | N/A | 11/10 | 1 | 5.07 | 5.07 | N/A |
| | | UW | | | | | | |
| MakerSpace | | Makerspace Bambu Labs | | | | | | |
| Print | Prototype v3 | | N/A | 11/13 | 1 | 4.5 | 4.5 | N/A |
| | | UW | | | | | | |
| | | Makerspace | | | | | | |
| MakerSpace | | Bambu Labs | | | | | | |
| Print | Prototype v3 | 3D Print | N/A | 11/14 | 1 | 4.96 | 4.96 | N/A |
| | | UW | | | | | | |
| MakarCass | | Makerspace | | | | | | |
| MakerSpace Print | Prototype v3 | Ultimaker 3D Print | N/A | 11/15 | 1 | 8.16 | 8.16 | N/A |

| Item | Description | Manufacture r | Part Number | Date | QTY | Cost Each | Total | Link |
|---------------------|--------------------------------------|---|----------------|-------|-----|--------------|-------|------|
| MakerSpace Print | Prototype v4 | UW Makerspace Ultimaker 3D Print | N/A | 11/17 | 1 | 10.08 | 10.08 | N/A |
| MakerSpace Print | Test Fixture | UW Makerspace Ultimaker 3D Print | N/A | 11/29 | 1 | 13.78 | 13.76 | N/A |
| MakerSpace Print | Final Prototype | UW Makerspace Ultimaker 3D Print | N/A | 12/1 | 1 | 7.36 | 7.36 | N/A |
| MakerSpace Print | Multiple Final Prototypes | UW Makerspace Ultimaker 3D Print | N/A | 12/8 | 1 | 11.6 | 11.6 | N/A |
| MakerSpace Print | Multiple Final Prototypes | UW Makerspace Ultimaker 3D Print | N/A | 2/6 | 1 | 7.84 | 7.84 | N/A |
| MakerSpace Print | Prototype Adjusted For IM | UW Makerspace Ultimaker 3D Print | N/A | 2/23 | 1 | 2.15 | 2.15 | N/A |
| MakerSpace Print | Parts for Connection Mechanism | UW Makerspace Ultimaker 3D Print | N/A | 2/26 | 1 | 2.8 | 2.8 | N/A |
| MakerSpace Print | Prototypes for Testing | UW Makerspace Ultimaker 3D Print | N/A | 3/4 | 1 | 8.2 | 8.2 | N/A |
| MakerSpace Print | Prototypes for Testing | UW Makerspace Ultimaker 3D Print | N/A | 3/4 | 1 | 8.75 | 8.75 | N/A |

Upcoming Team and Individual Goals:

Team:

The team will present at the final poster presentation to our advisor and to the tong judges. The team will finish up all final deliverables in preparation for the due date next week. Lastly, the team will attend the BME barcrawl

Individual:

- Jenna:
 - > Present at the team's final poster presentation :(
 - > Finish journal article
 - > Finish Lab Archive entries and upload to team website
- **&** Eva:
 - > Present poster with team!
 - > Finish journal article
 - ➤ Update LabArchives
- **❖** Tevis:
 - > Practice the presentation for Advisor and for Tong judges
 - > Add entries to labarchives
 - > Work on my journal article sections
- **Tommy:**
 - > Present the final poster presentation on Friday
 - ➤ Make final changes to LabArchives entries
 - ➤ Make final changes to the journal article
- **❖** Kasia:
 - ➤ Present final poster for advisors and Tong judges
 - > Complete journal article
 - > Finish Lab Archives entries (focusing on marketing)
- **❖** Anabelle:
 - > Present final poster with the team this friday
 - ➤ Complete the thematic analysis portion of the journal article and review the whole article for submission
 - > Update lab Archives entries

Timeline:

| Task | Jan | | F | eb | | | | March | า | | | Αŗ | oril | | May | |
|-------------|-----|---|---|----|----|---|---|-------|----|----|---|----|------|----|-----|----|
| | 26 | 2 | 9 | 16 | 23 | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 3 | 10 |
| Project R&D | | | | | | | | | | | | | | | | |
| Research | 1 | 1 | | | | | | | | | | | | | | |

| Prototyping | 1 | 1 | 1 | 1 | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|--|--|
| Testing | | | | | / | 1 | / | / | / | / | / | | |
| Deliverables | | | | | | | | | | | | | |
| Progress Reports | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Prelim presentation | | | 1 | | | | | | | | | | |
| Final Poster | | | | | | | | | | | | | |
| Meetings | | | | | | | | | | | | | |
| Client | | 1 | | 1 | | 1 | | 1 | | 1 | | | |
| Advisor | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Website | | | | | | | | | | | | | |
| Update | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |

| Project Goal | Deadline | Assigned | Progress | Completed |
|-------------------------------|----------|----------|-------------|-----------|
| Preference Human Testing | 2/29 | All | Completed | Yes |
| Preliminary Oral Presentation | 2/9 | All | Completed | Yes |
| Preliminary Deliverables | 2/28 | All | Completed | Yes |
| Show and Tell | 3/22 | All | Completed | Yes |
| Executive Summary | 4/19 | All | In Progress | |
| Final Poster Presentation | 4/26 | All | Not Started | |
| Final Deliverables | 5/1 | All | Not Started | |

Summary of Weekly Team Member Design Accomplishments

Team: The team completed the poster for the poster presentation and practice presenting as a team. The team also analyzed the preference testing results by performing a thematic analysis.

Individual:

- Jenna:
 - > Printed packaging stickers from Tommy's Logo design
 - > Assembled sample clamshell packaging for presentation
 - > Finalized and printed final poster
- **&** Eva:
 - > Printed preference test survey for presentations

> Finished poster and practiced presenting with team

❖ Tevis^{*}

- > Finished poster sections
- > Worked with Tommy to brainstorm universal design
- > Practiced poster presentation

Tommy:

- > Completed the poster and began practicing with the team
- Created MyDropper logo and branding details
 - Added entries about branding guidelines to LabArchives
 - Helped create a color scheme for the instructions for use

Kasia:

- > Finished poster and practiced presentation with team
- ➤ Completed executive summary based off of feedback from advisor
- ➤ Added lab archive entries related to marketing and IP conversations

❖ Anabelle:

- > Finished poster and practiced presenting with the team
- > Completed design instructions for the packaging
- > Added preference testing visuals to the final poster