

EYE DROPPER ASSISTANT, BME 402

Date: 02/22/24

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BSAC: Tevis Linser (linser@wisc.edu)

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.

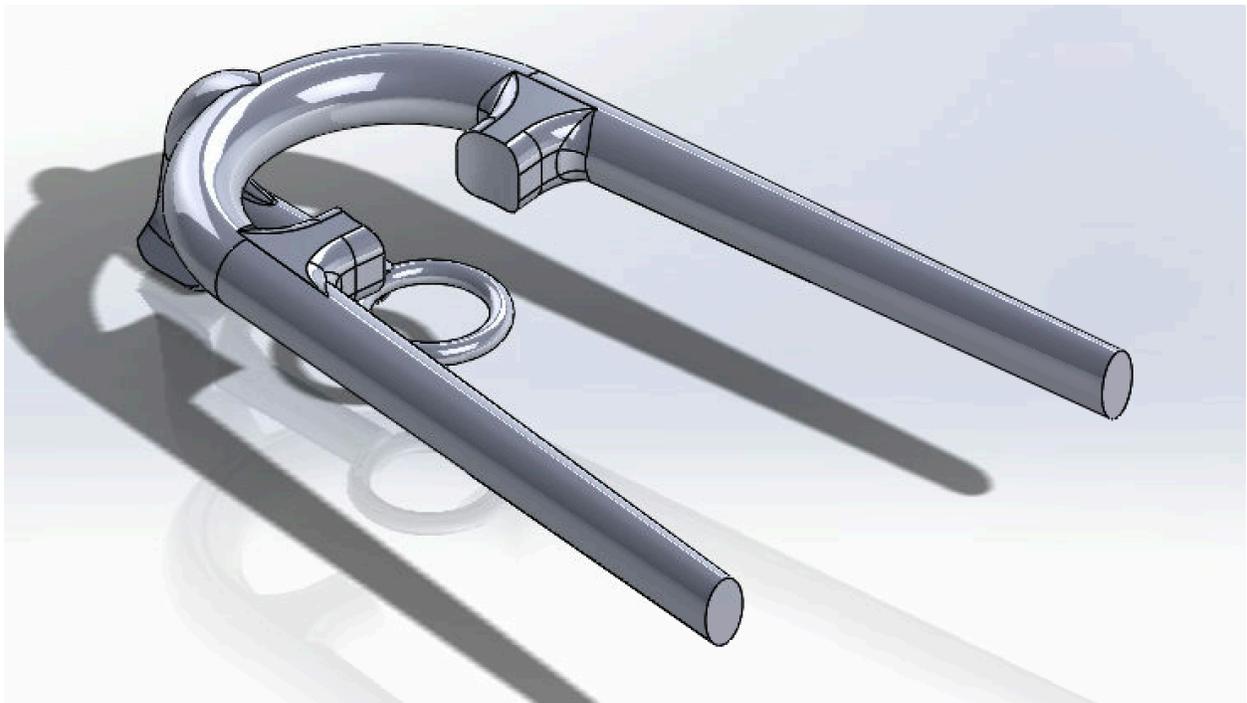
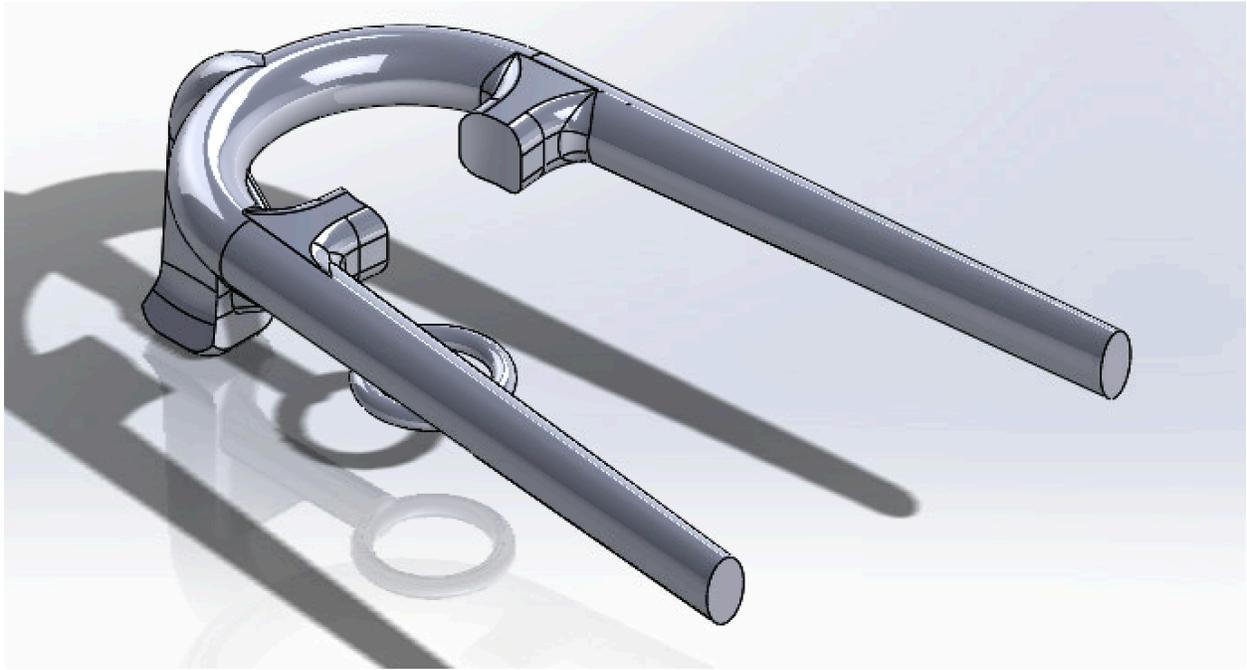
Brief Status Update:

The team is working towards finishing the draft of the journal article. Additionally, the end of the IRB application timeline is in sight and the team is hoping to conduct the feasibility study in the next one or two weeks.

Difficulties & Advice Requests:

The team is exploring options for manufacturing. Injection molding is one option, however, it can be expensive and there are limited resources here at UW. The other option is to stick with 3D printing. Either way, the team plans on exploring a variety of materials to maximize the lifetime of the product.

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:

Item	Description	Manufacturer	Part Number	Date	QTY	Cost Each	Total	Link
Existing Devices								
Droppy Eye Drop Dispenser	Competing Design	Droppy, Amazon	DR001	9/25	1	9.99	9.99	Link
GentleDrop Eye Drop Guide	Competing Design	GentleDrop, Amazon	ASIN: B0BQBHRKV1	9/25	1	17.99	17.99	Link
Prototyping								
Silicone Eyelash Curler	Prototype Materials (Handle Grips)	PETUNIA SKINCARE, Amazon	ASIN: B00UVLNDVQ	10/25	1	7.49	7.49	Link
MakerSpace Print	Prototype v1	UW Makerspace Ultimaker 3D Print	N/A	10/31	1	4.96	4.96	N/A
MakerSpace Print	Prototype v2	UW Makerspace Ultimaker 3D Print	N/A	11/10	1	5.07	5.07	N/A
MakerSpace Print	Prototype v3	UW Makerspace Bambu Labs 3D Print	N/A	11/13	1	4.5	4.5	N/A
MakerSpace Print	Prototype v3	UW Makerspace Bambu Labs 3D Print	N/A	11/14	1	4.96	4.96	N/A
MakerSpace Print	Prototype v3	UW Makerspace Ultimaker 3D Print	N/A	11/15	1	8.16	8.16	N/A

Item	Description	Manufacturer	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	Final Prototypes	UW Makerspace Ultimaker 3D Print	N/A	12/8	1	7.84	7.84	N/A

Upcoming Team and Individual Goals:

Team: The team is going to begin conducting research for the journal entry. The team continues to refine and make edits to the IRB as needed. The team plans on further exploring packaging options as well as altering the prototype to make it easier to injection mold. The team also has a meeting scheduled Friday with the client and one of her connections to look into market opportunities.

Individual:

- ❖ Jenna:
 - Complete preliminary deliverables of journal articles and lab archives notebook
 - Work on Shark Tank slides for initial draft on Tuesday
 - Continue researching market analysis research
- ❖ Eva:
 - Finish journal article draft - specifically focusing on methods and results

Project Goal	Deadline	Assigned	Progress	Completed
Preference Human Testing	2/29	All	In Progress	
Preliminary Oral Presentation	2/9	All	Completed	Yes
Preliminary Deliverables	2/28	All	In Progress	
Show and Tell	3/22	All	Not Started	
Executive Summary	4/19	All	Not Started	
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 had a client meeting on Friday to discuss plans for Shark Tank. The team also discussed possible market opportunities for the device. A few team members are working on remodeling the prototypes to allow for easier fabrication and ensure more strength.

Individual:

- ❖ Jenna:
 - Look into current journal articles similar to our project
 - Plan and attend outreach design session
 - Started looking into market research for eye drop devices
- ❖ Eva:
 - Met with Laura Conger from IRB to discuss the second round of IRB edits
 - Completed IRB and submitted for approval
 - Completed a market analysis for eye drop assistant devices
- ❖ Tevis:
 - Worked on possible design changes for injection molding
 - Looked into different research articles and their requirements
 - Met with Paula to discuss the Injection molding capability at the discovery center
 - Attended outreach
- ❖ Tommy:
 - Separated and redesigned SolidWorks models for analysis
 - Attended outreach research session

- ❖ Kasia:
 - Conducted research on the current market for assistive devices for dispensing eye drops
 - Reviewed existing journal articles to gain insight on how to write the abstract for eye drop assistive device journal article
- ❖ Anabelle:
 - Created journal template with summaries of sections based upon a few example articles from Assistive Technology journal and assigned sections to the team.
 - Conducted current market research for eye drop assist devices and documented research in lab archives