

EYE DROPPER ASSISTANT, BME 402

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BPAG: Tommy Kriewaldt (tkriewaldt@wisc.edu)

BWIG: Jenna Krause (jlkrause4@wisc.edu)

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.

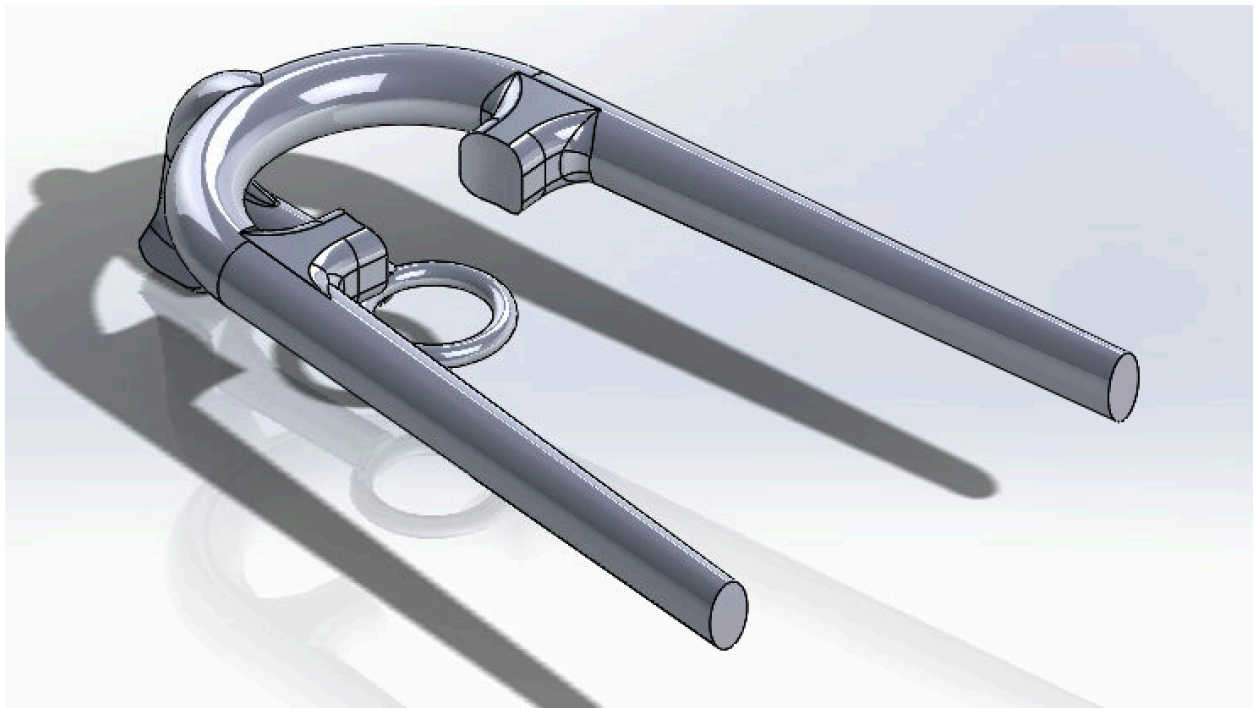
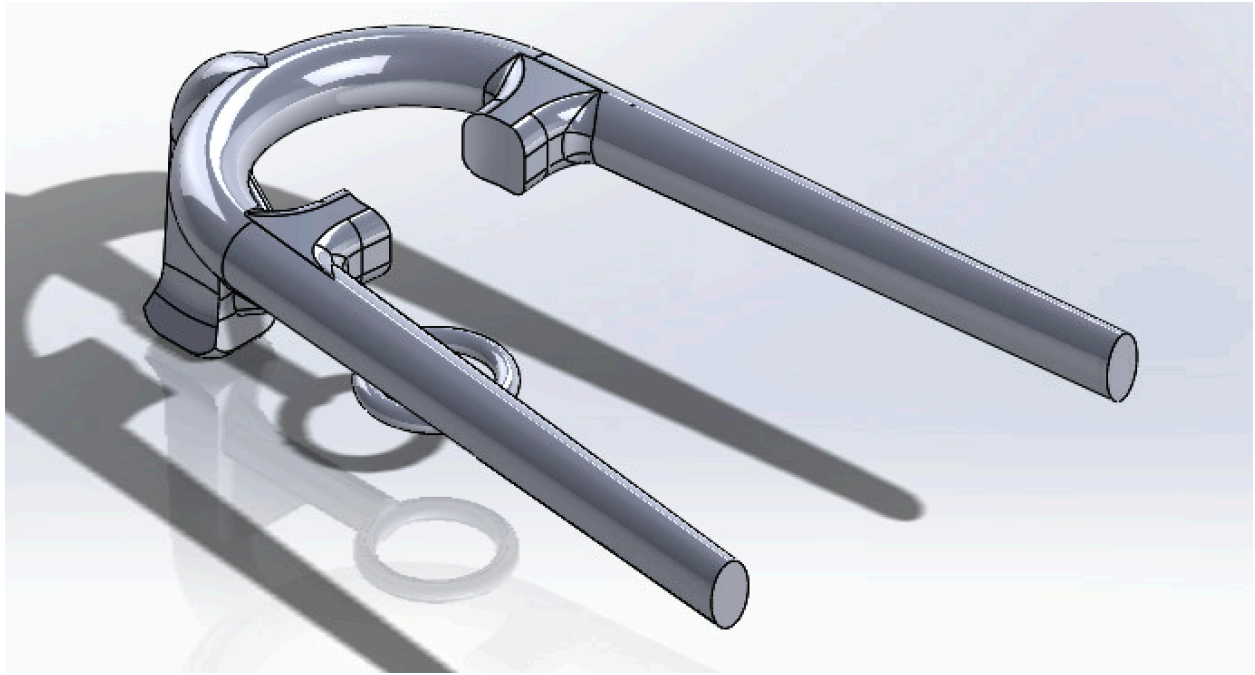
Brief Status Update:

The team has decided not to pursue the second IRB due to time constraints. Instead, the team is focusing their energy on analyzing preference testing results and conducting the single drop test with other participants to avoid bias. The team is also focusing on finalizing the ShaRx Tank presentation and preparing for the final poster presentation and Tong competition.

Difficulties & Advice Requests:

The team has been taking on a few too many tasks at once and has decided not to do certain things to ensure all design requirements are being met. The team wants to be sure to complete required assignments to the best of their ability.

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	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 conduct and analyze the single drop test. The team will also analyze the initial preference testing. The team hopes to have a new version of the prototype in the near future that will accommodate multiple size eye drop bottles, based off advice from Harrow Health CEO, Mark Baum.

- ❖ Jenna:
 - Complete single drop test with BME 201 students.
 - Finalize and attend outreach presentations
 - Get a sample packaging container and working on labeling
- ❖ Eva:
 - Pull statistics from preference testing
 - Perform single drop testing with BME 201 students
 - Update ShaRx Tank slides
- ❖ Tevis:
 - Work with ME friend to potentially get mold machined
 - Work on redesigns for a more universal device
 - Conduct single drop testing with new population
- ❖ Tommy:
 - Finalize sketches of new prototype
 - Build the new prototype in SolidWorks
 - Export and print the .STL file
 - Adjust the SolidWorks model as needed
- ❖ Kasia:
 - Analyze preference testing
 - Conduct single drop test (after spring break)
 - Finalize Shark Tank slides
- ❖ Anabelle:
 - Analyze preference testing results
 - Conduct single drop test with teams
 - Finish shark tank slides

Timeline:

Task	Jan	Feb				March					April				May	
	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10
Project R&D																
Research	✓	✓														
Prototyping	✓	✓	✓	✓												
Testing					✓	✓	✓	✓	✓							

Deliverables																
Progress Reports	✓	✓	✓	✓	✓	✓	✓	✓	✓							
Prelim presentation			✓													
Final Poster																
Meetings																
Client		✓		✓		✓		✓								
Advisor	✓	✓	✓	✓	✓	✓	✓	✓	✓							
Website																
Update	✓	✓	✓	✓	✓	✓	✓	✓	✓							

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	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 completed their last round of preference testing. The team is also working on creating another prototype that will fit multiple size bottles and will be adjustable. This will make the device more universal.

Individual:

- ❖ Jenna:
 - Worked on outreach presentation/model
 - Decide on sample packaging sizes and reach out for potential samples.
 - Work with Eva on materials needed for outreach
- ❖ Eva:
 - Completed preference testing at retirement community
 - Had meeting on Monday with Mark Baum from Harrow Ophthalmic

- Got feedback on device changes and entrepreneurship
 - Scheduled client meeting to review ShaRx Tank slides when we get back from break
- ❖ Tevis:
 - Measured small bottle for Tommy
 - Met with Tommy to brainstorm new possibilities for universality
 - Fabricated outreach prototype
 - Completed preference testing at oak wood
- ❖ Tommy:
 - Obtained more specific measurements of small bottles
 - Sketched preliminary version of a new prototype design
 - Obtained materials for outreach project
 - Created SolidWorks models of hand and control buttons for outreach project
- ❖ Kasia:
 - Met with Mark Baum from Harrow Health and received advice on the device and that market
 - Fabricated outreach project
 - Completed final round of preference testing
- ❖ Anabelle:
 - Completed second round of preference testing
 - Attended tong lecture
 - Constructed outreach prototype with students