EYE DROPPER ASSISTANT, BME 402

Date: 04/04/2024

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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

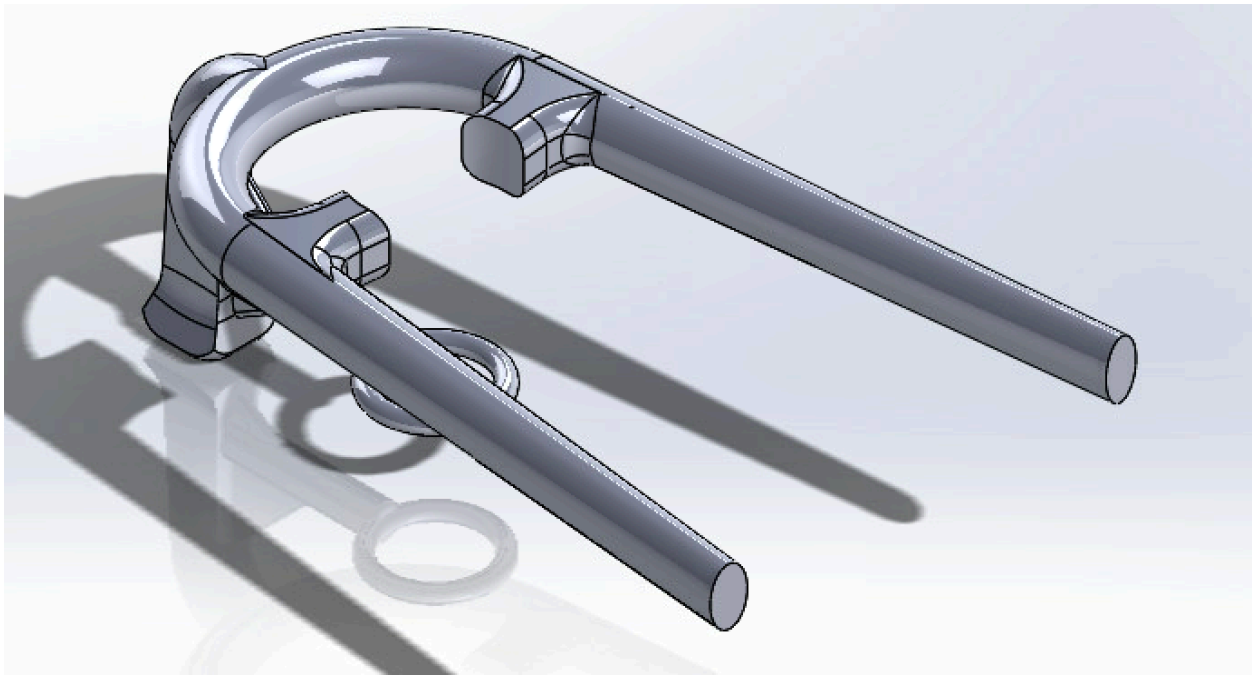
Administration of eye drops is difficult for patients, especially older adults and those with limiting diseases like arthritis. This results in eye drop waste and tip contamination. The team will design a device to assist patients in squeezing the eye drop bottle while releasing a consistent amount of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

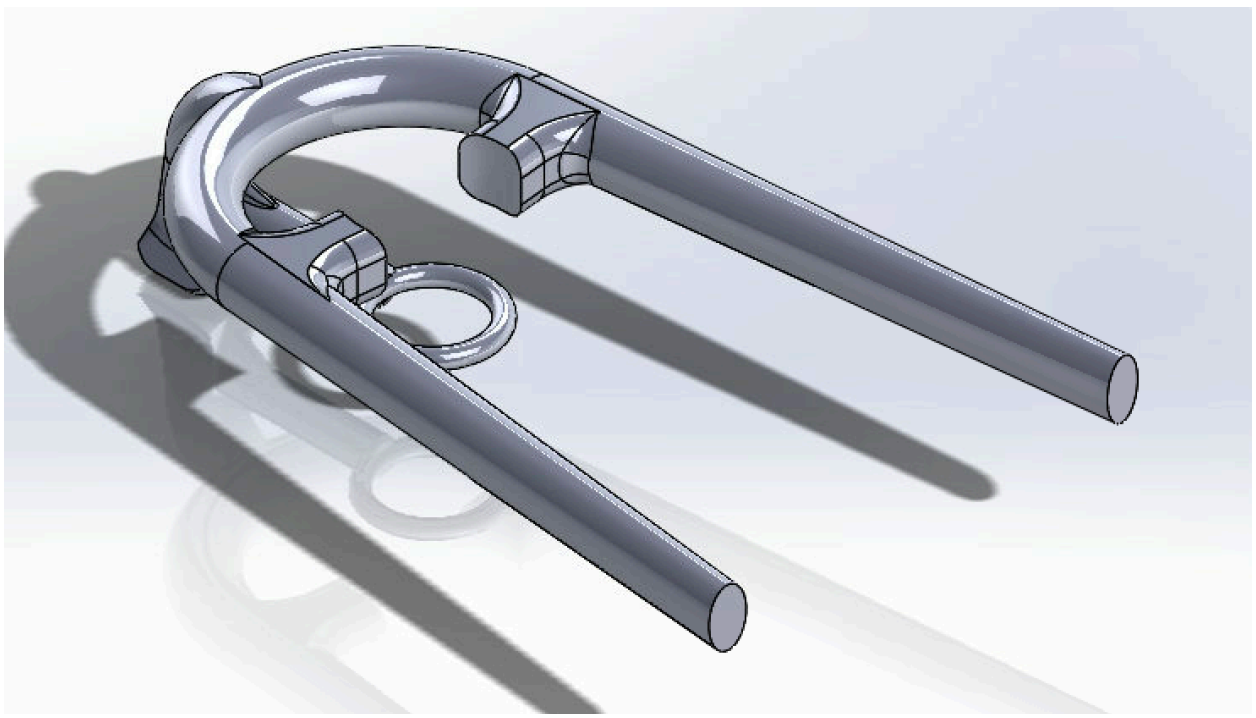
Brief Status Update:

The team met with the ShaRx Tank teams and administers for a logistics meeting and practice. The team also completed the second rounds of single drop testing, this time using BME 201 students.

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:

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 complete the executive summary for submission on Friday. The team will also present at ShaRx Tank next Thursday with Ryan. Lastly, the team will begin to analyze data from both the new single drop test and the preference test.

Individual:

- Jenna:
  - Look into ShaRx Tank rubric and finalize slides based on them.
  - Determine which packaging option is best for the device
  - Finish draft of executive summary
- Eva:
  - Finish ShaRx Tank slides and send pre recorded pitch to client for review
  - Meet with client to prepare for ShaRx Tank and update her on our progress
  - Analyze single drop test
- Tevis:
  - Meet with team to practice sharx tank pitch
  - Attend final outreach session for presentations
  - Work on analysis of drop test and preference feedback
- Tommy:
  - Print the new prototype and make adjustments as needed
  - Do research on mechanisms we can use to connect components of our device
  - Complete sections of the executive summary draft
- Kasia:
  - Analyze single drop test
  - Finalize ShaRx Tank slides
  - Finish executive summary
- Anabelle:
  - Analyze single drop testing
    - Design graph or chart to communicate the data visually
  - Finish ShaRx Tank Slides and pre record a pitch with Ryan
  - Complete Executive summary for submission

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	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 new single drop testing using random subjects. The team also met with the ShaRx board to go over expectations for the presentation.

Individual:

- Jenna:
  - Ordered 4 stock packaging options
  - Determine and created executive summary for Tong Design
  - Conduct single drop test with 201 students
- Eva:
  - Completed sections of executive summary

- ➢ Joined ShaRx Tank call with the pharmacy school for the last practice round

❖ Tevis:
- ➢ Worked on section for executive summary for tong award
- ➢ Met with ShaRx people to go through ShaRx Tank logistics
- ➢ Met with team to do single drop testing
- ➢ Fabricated outreach prototype

❖ Tommy:
- ➢ Completed preliminary sketches of a new prototype
- ➢ Built the new prototype in Solidworks and exported it as an STL file
- ➢ Collected purchasing details for outreach presentation

❖ Kasia:
- ➢ Conducted large bottle single drop test
- ➢ Conducted small bottle singe drop test
- ➢ Met with ShaRx Tank members to go over expectations

❖ Anabelle:
- ➢ Met with ShaRx Tank teams and board to go over the logistics for next thursday
- ➢ Completed entering the preference testing protocol survey questionnaire into Excel.
- ➢ Conducted a single drop test with team members.