

Progress Report - Week 5

Title: Vaginal Self-Swab Device to Minimize Contact Contamination

Client: Dr. Jean Riquelme

Advisor: Dr. Megan McClean

Team:

Sara Morehouse (Leader)

Cherry Qiu (Communicator)

Katherine Kafkis (BWIG and BSAC)

Adam Berdusco (BPAG)

Date: February 29, 2024

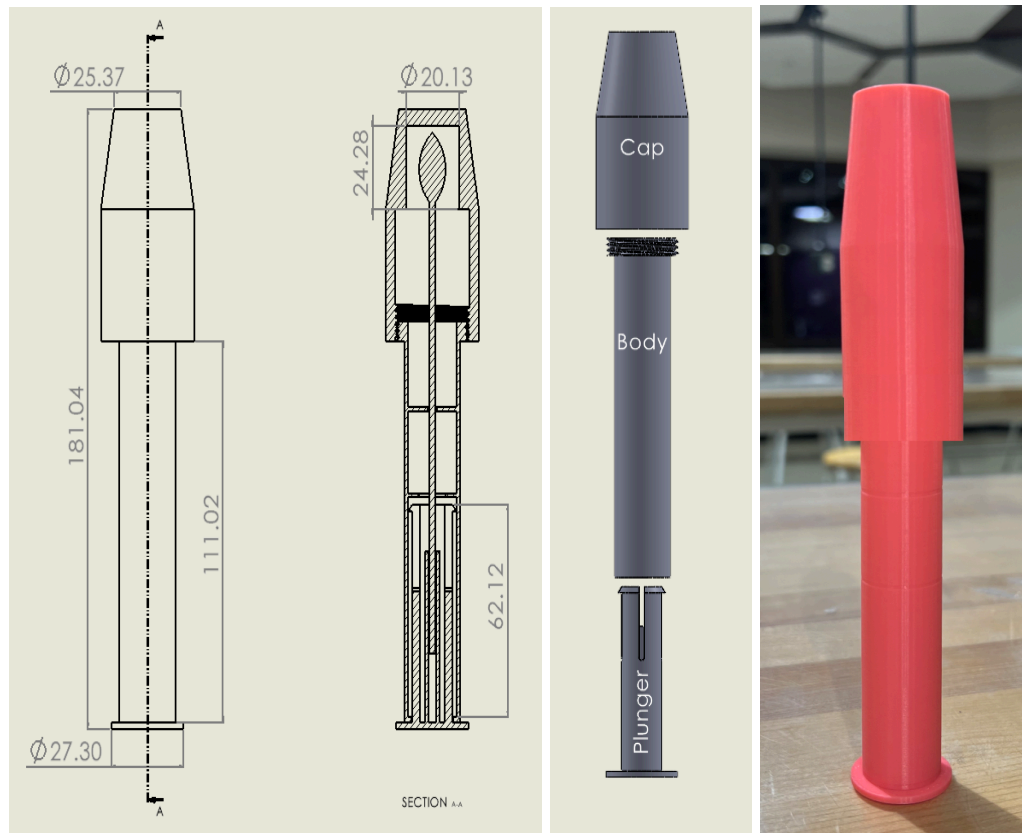
Problem Statement:

Quality sexual health is important for every woman to sustain, but with women ages 15-24 accounting for 43% of undiagnosed STI cases, the system supporting women's sexual health could use some improvement (CDC). The team has developed a novel self-swab STI testing device that allows women the privacy of swabbing themselves without the potential discomfort of a physician present. This was conceived with the goal in mind of making STI testing more accommodating while reducing contamination of the testing environment. However, the current design has issues with media leaking from the device after use, as well as with the aesthetics of the design. Additionally, the device requires the addition of a thin, puncturable film to the cap to contain transport media. The team is tasked with modifying the original design to address the issues currently being faced while still seeking to limit contamination of the device and testing environment as well as account for patient comfort.

Brief Status Update:

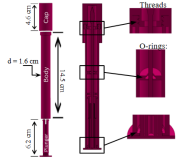
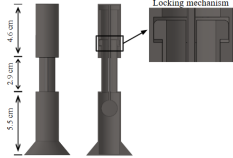
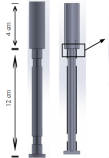
This week the team met with Dr. Accola from the UW Health Lab that processes the STI samples. During this meeting, we learned about the machine that is used to automate the process, which is designed specifically for Hologic test tubes. Thus, we must consider this as an important factor in our next iteration of designs. We also worked on completing the preliminary presentation and the preliminary design report.

Current Design:



The current design was developed last semester and includes a plunger, body and cap. The prototype was 3D-printed and assembled with the plunger being inserted into the bottom of the body, and the cap screws onto the top of the body. A swab is inserted through the body and into the plunger.

Design Matrix:

Criteria	Weight	Modified Plunger		Snap On		Pull Back	
							
Limiting contamination	30	5/5	30	3/5	18	5/5	30
Leakage Prevention	25	4/5	20	5/5	25	4/5	20
Ease of use	15	4/5	12	5/5	15	3/5	9
Ease of fabrication	10	1/5	2	5/5	10	3/5	6
Patient Comfort	10	5/5	10	4/5	8	4/5	8
Safety	5	5/5	5	5/5	5	5/5	5
Cost	5	5/5	5	5/5	5	5/5	5
Total	100	84		86		83	

Materials and Expenses:

Item	Description	Manufac - turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Preliminary prototype print	Material: PLA	n/a	n/a	Makerspace	n/a	2/27	n/a	n/a	\$3.34	n/a
-									\$0.00	
-									\$0.00	
-									\$0.00	
-								TOTAL:	\$3.34	

Previous week's goals and accomplishments:

- Goal: Print prototypes and choose a final design.
 - We printed a couple different designs to see if they were possible to print. However, we did not choose a final design due to the new requirement of incorporating the Hologic testing machine.
- Goal: Complete the preliminary presentation and work on the preliminary report.
 - We have completed the presentation and will be presenting it on Friday. We have also begun work on the preliminary report.

Activities:

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Katherine	2/26	Completed the CAD of the pull-back design	2	3	14
	2/27	3D-printed the plunger and snap-on designs.	1		
Sara	2/25	Worked on SolidWorks designs and updating design matrix	2	4	13
	2/27	Completed presentation slides for preliminary presentation	2		
Cherry	2/27	Met with Dr. Accola to gain insight on STI test Processing	1	4	11.25
	2/27	Finished presentation slides	2		
	2/29	Practiced presentation with group	1		
Adam	2/27	Solidworks preliminary designs	2	4	14
	2/28	Worked on and practiced preliminary presentations	2		