

Progress Report - Week 4

Title: Vaginal Self-Swab Device to Minimize Contact Contamination

Client: Dr. Jean Riquelme

Advisor: Dr. Megan McClean

Team:

Sara Morehouse (Leader)

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Katherine Kafkis (BWIG and BSAC)

Adam Berdusco (BPAG)

Date: February 22, 2024

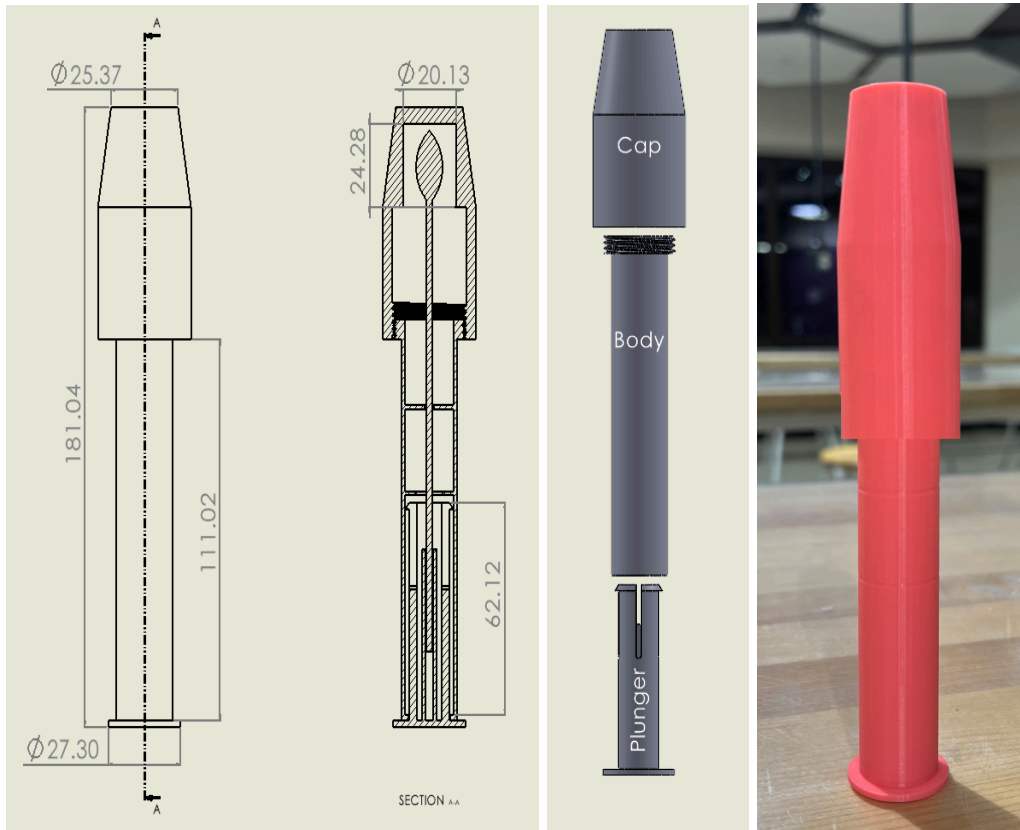
Problem Statement:

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:

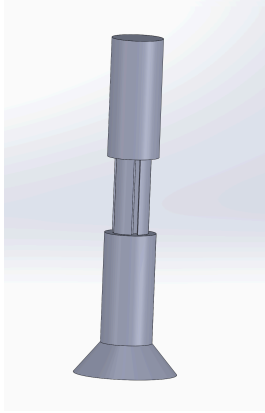

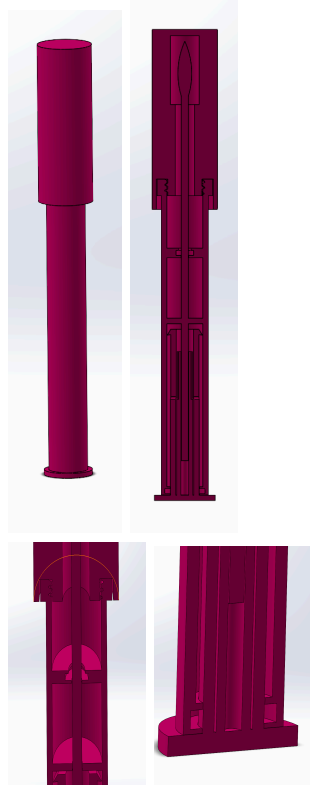
This week the team met with the Design Hub at the UW Team Lab and worked to update the preliminary design ideas. We also began work on the preliminary Design Report and presentation.

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.

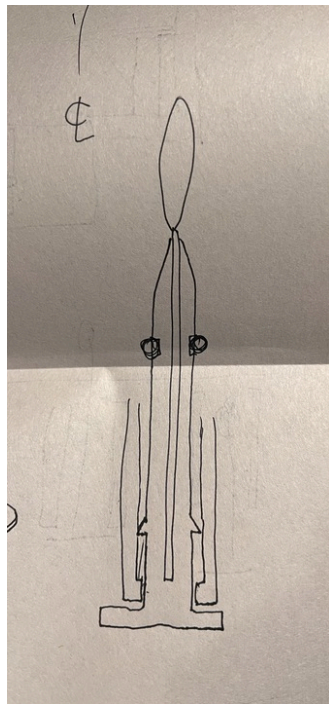
Design Matrix:

| Criteria | Weight | Design 1: | | Design 2: | | Design 3: | |
|------------------------|------------|---|----|--|----|--|----|
| | |  | |  | |  | |
| Limiting contamination | 30 | 3/5 | 18 | 4/5 | 24 | 4/5 | 24 |
| Leakage Prevention | 25 | 3/5 | 15 | 5/5 | 25 | 3/5 | 15 |
| Ease of use | 15 | 5/5 | 15 | 4/5 | 12 | 4/5 | 12 |
| Ease of fabrication | 10 | 3/5 | 6 | 2/5 | 4 | 4/5 | 8 |
| Patient Comfort | 10 | 3/5 | 6 | 3/5 | 6 | 5/5 | 10 |
| Safety | 5 | 5/5 | 5 | 5/5 | 5 | 4/5 | 4 |
| Cost | 5 | 5/5 | 5 | 4/5 | 4 | 5/5 | 5 |
| Total | 100 | 70 | | 80 | | 78 | |

| | | | | | | | | | | | | | | | | | |
|----------------------------|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Prototyping | | | | | | | | | | | | | | | | | |
| Testings | | | | | | | | | | | | | | | | | |
| Deliverables | | | | | | | | | | | | | | | | | |
| Progress Reports | | X | X | X | X | | | | | | | | | | | | |
| PDS | | | X | | | | | | | | | | | | | | |
| Prelim presentation/report | | | | | | | | | | | | | | | | | |
| Final Poster | | | | | | | | | | | | | | | | | |
| Meetings | | | | | | | | | | | | | | | | | |
| Client | | | X | | | | | | | | | | | | | | |
| Advisor | X | X | X | X | X | | | | | | | | | | | | |
| Website | | | | | | | | | | | | | | | | | |
| Update | X | X | X | X | X | | | | | | | | | | | | |

Previous week’s goals and accomplishments:

- Goal: Modify designs if needed and choose a final design.
 - The team met with Jesse from the Design Hub and was able to update the SolidWorks designs. We will work on printing those designs next week.



- - New idea for plunger design that should prevent leaking of media from the cap via an O-ring.

Activities:

| Name | Date | Activity | Time (h) | Week Total (h) | Sem. Total (h) |
|-----------|---------|--|----------|----------------|----------------|
| Katherine | 2/22/24 | Met with Jesse from the design hub to discuss O-ring seals, interior threading, and slider deployment mechanisms | 1 | 3 | 11 |
| | 2/22/24 | Began updated current plunger design incorporating ideas from the meeting with Jesse. | 2 | | |
| Sara | 2/21/24 | Began work on the preliminary presentation/preliminary report. | 1 | 1.5 | 9 |
| | | Updated design | 0.5 | | |
| Cherry | 2/22/24 | Met with Jesse from the design hub to discuss our potential designs | 1 | 3 | 7.25 |
| | 2/22/24 | Started working on sections of the preliminary report and presentation | 2 | | |
| | | | | | |
| Adam | 2/21/24 | Start working on preliminary deliverables | 2 | 2 | 10 |