EarVac: Negative Pressure Wound Therapy Device for Improved Microtia Reconstruction Surgery Recovery

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Team: Bryan Heaton (Leader)
Meghan Kaminski (Communicator)
Dhruv Nadkarni (BWIG)
Serena Evers (BSAC)
Harshad Gunasekar (BPAG)
Muhaison Ibrahim

Date: October 3, 2025 - October 9, 2025

Problem Statement

Newly reconstructed auricles after microtia surgery are fragile, prone to destructive fluid build up, and difficult to dress securely. Clinicians need a conformal negative-pressure wound therapy device that holds a foam dressing over the ear, maintains consistent negative pressure over complex 3D geometry, and safely collects drainage from existing drains to reduce complications and support consistent healing.

Brief Status Update

The team finished the preliminary report on Wednesday and are meeting the representative from Solventum on Thursday.

Summary of Weekly Team Member Design Accomplishments

- Team:
    - Worked on preliminary presentations

    - Completed the preliminary report
    - Continued general research
- Bryan Heaton
    - Re-worked PDS to better fit project scope
    - Wrote discussion, conclusion sections of PDS
    - Wrote abstract of PDS
    - Wrote NDA for Solventum meeting
- Meghan Kaminski
    - Worked on methods and materials section of the preliminary report
    - Worked on the final design portion of the preliminary presentation
    - Met with the representative from Solventum
    - Researched specific used of NPWT on microtia
    - Improved the CAD designs
- Serena Evers
    - Worked on background and introduction of the final report
    - Met with the representative from solventum
- Harshad Gunasekar
    - Worked on preliminary presentation
    - Continued research
- Dhruv Nadkarni
    - Researched testing outcomes for NPWT
    - Worked on testing and results section of preliminary presentation

Weekly/Ongoing Difficulties

Upcoming Team and Individual Goals

- Team:
    - Client meeting with Nada
    - Continue general research
    - Finish final design details
    - Make all necessary changes to the PDS
- Bryan Heaton
    - Refresh CAD skills to contribute to design choices more effectively
    - Begin drafting testing protocols
    - Organize team meeting to align on current understanding of design and research
- Meghan Kaminski
    - Continue general research
    - Continue improving the CAD design
    - Schedule meeting with Nada and Dr. Cho
- Serena Evers
    - Start finding materials to purchase and start the fabrication and testing protocol

- Harshad Gunasekar
    - Refresh CAD skills for final design updates
    - Continue general research
- Dhruv Nadkarni
    - Starting drafting test protocols with specific measured values
    - Design inputs to prevent backflow

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Product Design Specification (PDS)	September 19, 2025	All	100%	X*
Design Matrix	September 26, 2025	All	100%	X
Preliminary Presentations	October 3, 2025	All	100%	X
Preliminary Deliverables	October 8, 2025	All	100%	X
Show and Tell	October 31, 2025	All	0%	
Poster Presentations	December 5, 2025	All	0%	
Final Deliverables	December 10, 2025	All	0%	

*PDS will require heavy revision following project focus shift

Expenses

Item	Description	Manufacturer	Part Number	Date	QTY	Cost Each	Total	Link
Component 1								
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Component 2								
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Component 3								
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL:								**$0.00**