Novel Negative Pressure Wound Therapy Device for Microtia Surgery Recovery in Children

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

Date: September 26, 2025 - October 2, 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

Summary of Weekly Team Member Design Accomplishments

- Team:
    - Continued research
    - Redeveloped preliminary designs and voted on design matrix

    - Worked on preliminary presentation
- Bryan Heaton
    - Redrafted PDS
    - Worked on PDS and existing products sections of preliminary presentation
    - Reworked problem statement
- Meghan Kaminski
    - Worked on CAD drawing of design for preliminary presentation
    - Practiced preliminary design presentation
    - Continued general research
- Serena Evers
    - Researched existing studies on using NPWT after microtia reconstruction surgery
    - Continued general research on microtia
    - Worked on future work section of preliminary presentation
        - Drafted testing ideas
- Harshad Gunasekar
    - Researched demographics and background on Microtia
        - NWPT applications and complications post-surgery
    - Worked on Overview, Problem statement, microtia and project background sections of the preliminary presentation
- Dhruv Nadkarni
    - Researched complications following NPWT on microtia reconstruction surgery
    - Worked on preliminary design and design matrix section of preliminary presentation.

Weekly/Ongoing Difficulties

Upcoming Team and Individual Goals

- Team:
    - Work on preliminary deliverables
- Bryan Heaton
    - Continue drafting NDA
    - Continue to gain understanding of microtia
    - Start researching material options
- Meghan Kaminski
    - Begin working on sections of preliminary report
    - Confirm meeting with the representative
    - Continue researching fabrication methods
- Serena Evers
    - Start drafting fabrication protocol
    - Look into possibility of human subjects testing
    - Being drafting testing protocol
- Harshad Gunasekar

    - Research possible materials that could be more compact than what was given by client
    - Work on building
- Dhruv Nadkarni
    - Work on preliminary deliverables.
    - Using complication research, draft potential test categories.

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	0%	X
Preliminary Deliverables	October 8, 2025	All	0%	
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**