



MEDesign

Co-Presidents: Sarah Rundquist and Anay Gupta



Founded in 2015,
MEDesign is a MedTech
startup incubator that
provides students with
hands-on medical device
design experience through
independent medical
device projects

Our Mission Statement

Equip students from **all backgrounds** with skills to **identify** and **solve** valuable problems, and make the world a **healthier place**

Equip students from **all backgrounds...**



We...

- Accept interested students from **all majors**
- Teach relevant **hard and soft skills** through **panels and workshops** for careers in health, consulting, design, and entrepreneurship
- Build a **community** of passionate students

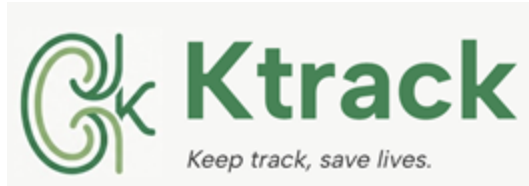
...to **identify** and **solve** valuable problems...

We...

- Find real need gaps through **interviews** with physicians and patients
- Teach **human-centered design** thinking
- Host **technical workshops** and trainings throughout the year
- Connect students with **experts** in the industry



...and make the world a healthier place.



Current Projects Highlight

K⁺ Track

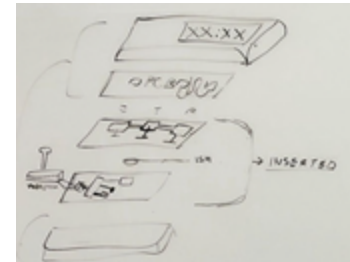
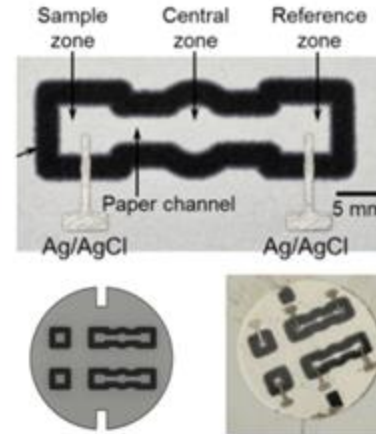
Team Lead: Sarah Rundquist

A way to **measure potassium levels at home** for **patients with chronic kidney disease** in order to **save time and enable vital monitoring and trend tracking**

Background and Market

- ⇒ 15% of Americans have chronic kidney disease
- ⇒ K⁺ monitoring prevents hyperkalemia, tracks disease progression, and betters medication outcomes
- ⇒ Current standard of care is venous blood draw at a hospital
- ⇒ Rural patients have to travel hours to receive testing and treatment

Preliminary Solution



Wheeze Watch

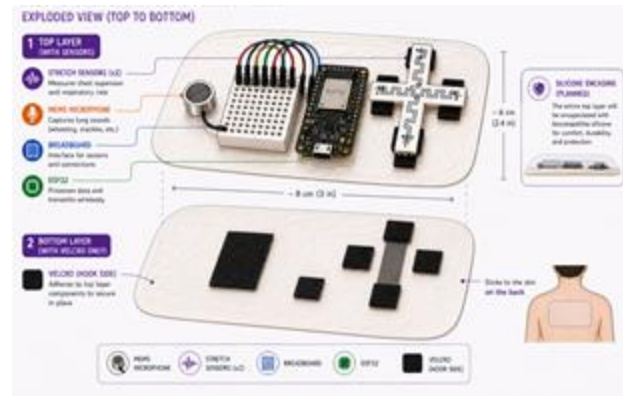
Team Lead: Vedika Kothari

A way to **continuously monitor respiratory health** in **pediatric asthma patients** in order to **prevent acute asthma attacks** and **better inform clinical decisions**.

Background and Market

- ⇒ Leads to 270,000+ ER visits yearly and \$5.9B in annual healthcare costs in the US.
- ⇒ Parents and clinicians emphasized the need for continuous, objective monitoring, as children are “poor perceivers” of their own health.

Preliminary Solution



Recent Achievements

MEDesign Recent Competitions

- BMES Medtronic Student Design Competition 2026 Finalist: **KTrack**
- Min Family Challenge 2026 Semi-Finalist Teams: **KTrack** and **Neurosense**
- Maseeh Entrepreneurship Prize Competition 2025 Finalist: **AdaProsthetics**
- Yearly **Grodins Symposium** poster presentations from all teams





How Can You Help?

Collaborate With Us

- Participate in a **corporate or academia panel**
- Serve as a **symposium panelist** giving feedback to our teams
- Be open to a **30 minute virtual interview** with teams working on projects in your field
- Act as a **virtual email-based mentor** providing asynchronous feedback for teams
- Become a **corporate sponsor!**

Scan For MEDesign



Collaboration Form!

[Link](#)

Thank You!

Any Questions?

Contact Info:

medesign@usc.edu

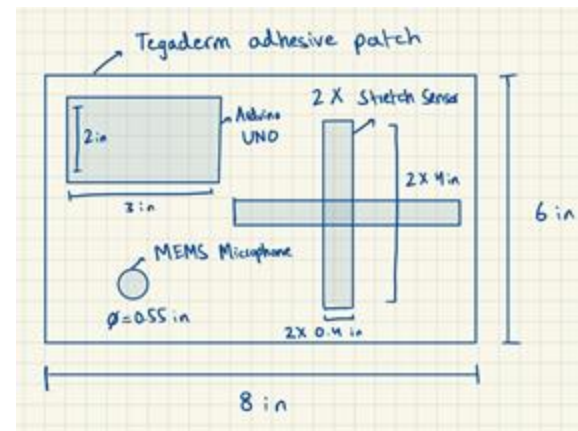
Anay Gupta: anaygupt@usc.edu

Sarah Rundquist: srundqui@usc.edu

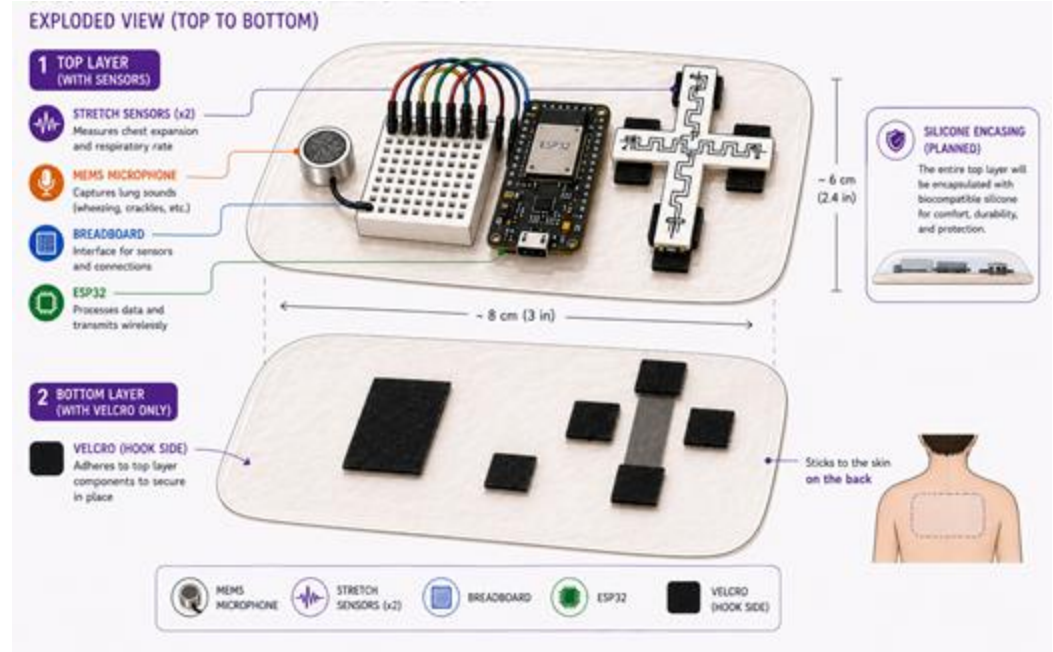
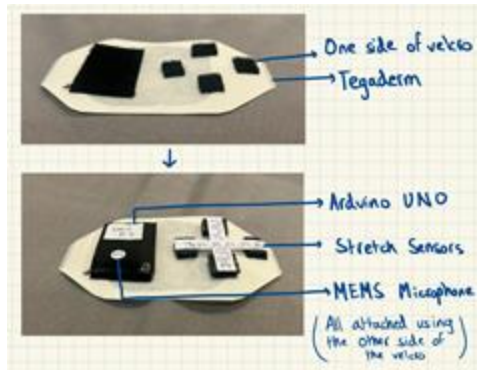
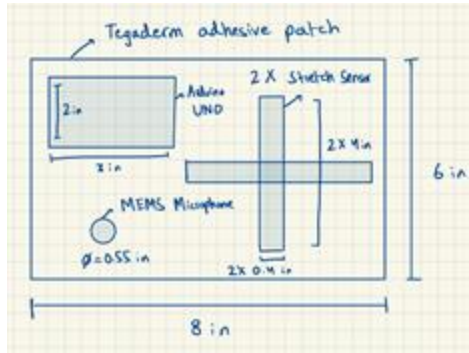
Appendix

Design Requirements

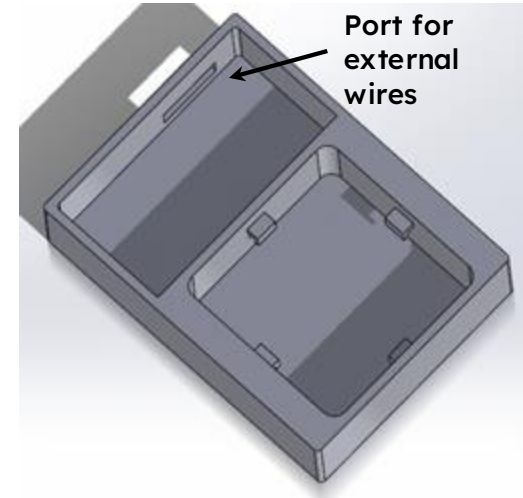
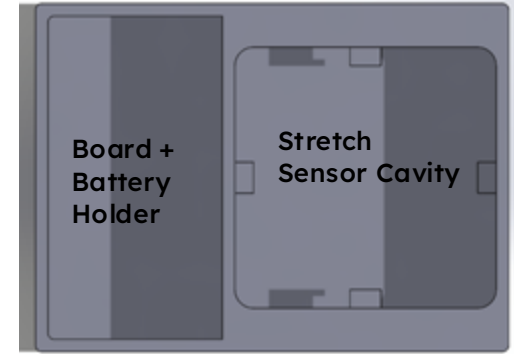
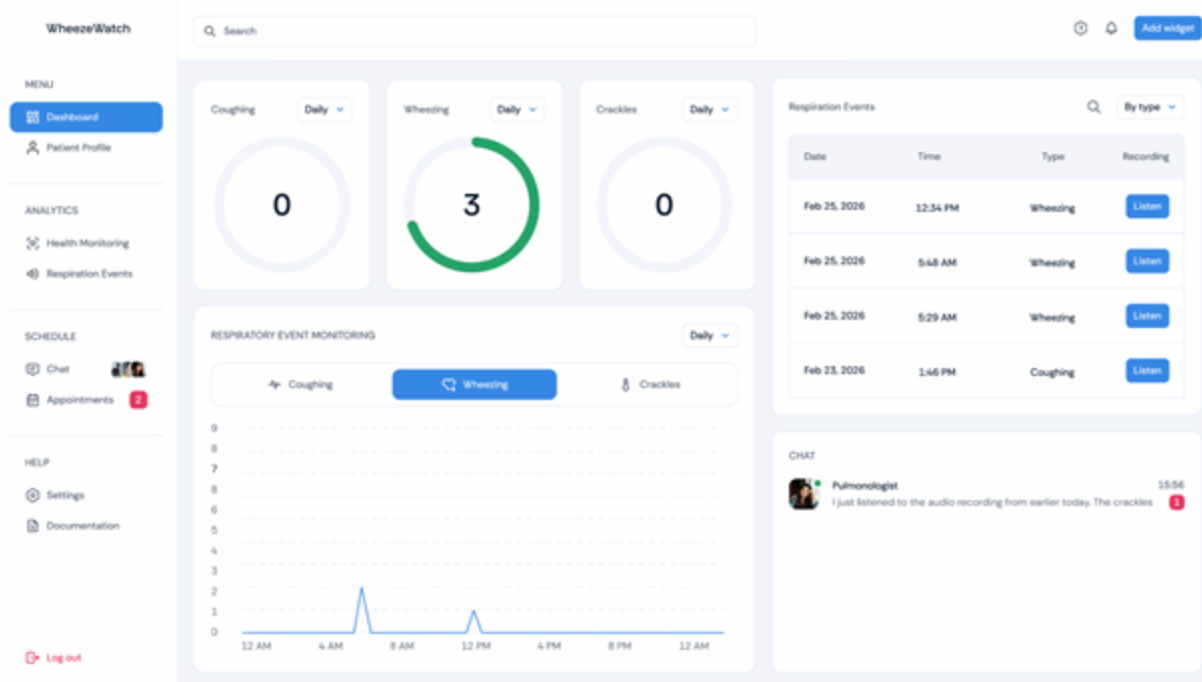
Requirement	Our Solution
Small form factor and placement to avoid fiddling	A wearable patch that is placed on the patient's back (with a MEMS microphone over the anterior heart)
Quantify respiratory rate	Use orthogonally arranged stretch sensors
Classify lung sounds	Use a pre-trained transformer model
Patient privacy with continuous recordings	Event-triggered recording only
Skin irritation from adhesive	Tegaderm is hypoallergenic + replaced every 2-3 days using a modular design
Data presentation for clinicians	Displays number of events (with classification and duration) since last visit. Clinicians can click on events and listen to audio recordings for each event



Prototyping

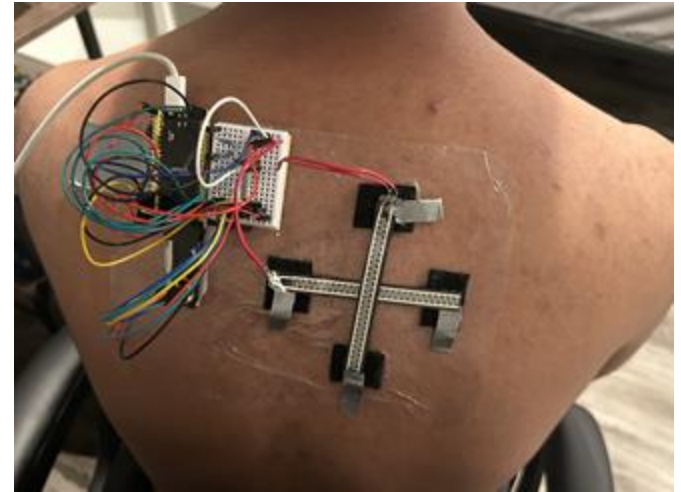


Prototype



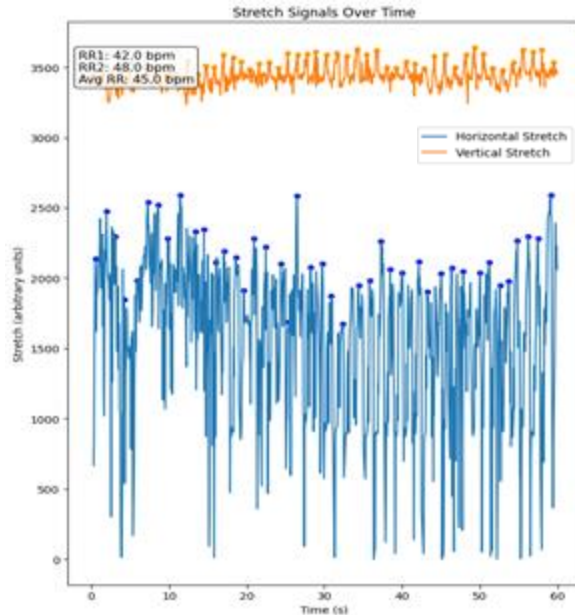
Testing

- Conducted preliminary verification testing
- Collected stretch sensor and microphone data across simulated breathing conditions with varying background noise levels
- Evaluated ease of application/removal
- Assessed prototype durability, user comfort, and impact on range of motion

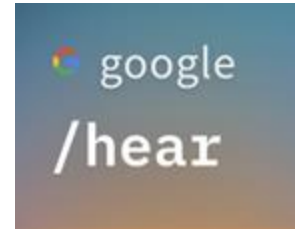
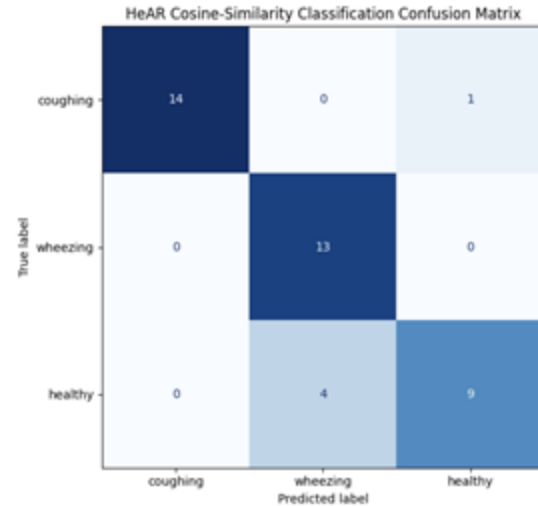


Data Analysis

Respiratory Rate: Peak Detection



Lung Sounds: Pre-trained Transformer



Metrics (weighted):
Accuracy : 0.8780
Precision : 0.8937
Recall : 0.8780
F1-score : 0.8762