

ClearPulse: Stethoscope with noise canceling headphones (and amplification option)

Date: 9/11/26 - 9/17/26

Client: Dr. Lenard Markman

Advisor: Prof. Randy Bartels

Team: Charlie Fischesser, Christian Dittmar Greaves, Johnny Sellers, Jonas Zhang, Josh Slager, Sam Wallin

Name	Email	Role
Josh Slager	jslager@wisc.edu	Co-leader
Charlie Fischesser	fischesser@wisc.edu	Co-leader
Christian Dittmar Greaves	cdittmargrea@wisc.edu	Communicator
Johnny Sellers	jsellers4@wisc.edu	BSAC
Sam Wallin	swallin3@wisc.edu	BWIG
Jonas Zhang	jjzhang6@wisc.edu	BPAG

Problem statement:

Traditional stethoscopes can be difficult to use effectively in noisy or high-vibration environments, including hospitals, helicopters, and ambulances. Environmental noise and poor acoustic conditions can interfere with healthcare providers' ability to accurately hear and distinguish heart and lung sounds, potentially compromising the reliability of auscultation. Additionally, prolonged use of traditional stethoscope ear pieces can lead to discomfort or ear canal irritation.

Our team will address these limitations by designing and fabricating a stethoscope system that incorporates active noise cancellation and optional noise amplification with passive noise isolation of over-the-ear headphones. The system will improve the clarity of heart and lung sounds across a broad range of environmental conditions while prioritizing comfort and ease of use. The final design must be durable, cost-effective, and manufacturable, with potential for commercial development through WARF or other outside organizations.

Brief status update:

Our team met to discuss the background research that each of us had conducted and to float any ideas for preliminary designs that had arisen thus far. We also discussed a meeting that Christian had with an EMT to gather more info about a reasonable price point and desired features. Finally, we spent most of our effort focused on researching in order to complete our product design specification (PDS).

Difficulties / advice requests:

None at the present moment.

Goals:

Major team goals for the next week

1. Start brainstorming product designs
2. Work on the design matrix
3. Set up a meeting with the client to discuss preliminary design ideas
4. If possible, decide on a design to move forward with

Next week's individual goals

Josh:

- Begin work on the design matrix
- Brainstorm at least 2 preliminary design ideas to discuss at team meeting
- Continue research on competing designs to find a niche

Charlie:

- Assist on design matrix
- Sketch out some brainstorms for our next meeting to discuss
- Research into products on the market related to our device (i.e digital stethoscopes)

Christian:

- Perform qualitative background research to validate the market need of this project via multiple EMT persons that I know, and document the findings.
- Study existing solutions and their success in the market.
 - Identify what is missing in the market, what is our competitive advantage?
- Based on the competitive advantage found, ideate different solutions and collaborate with the team to create a Design Matrix.

Johnny:

- Begin working on our Design Matrix
- Brainstorm ideas for our Design Matrix to share with the team on Monday
- Research our potential solutions that we will include in our Design Matrix
- Complete Intro to Machining Training

Sam:

- Begin to take gathered data/research and apply it to a preliminary design plan; work on design matrix criteria and design ideas
- Continue completing training material
- Continue market research

Jonas:

- Work on Design Matrix
- Continue Intro to Machining Training
- Research based on results from Matrix

Timeline

Task	Sept				October				November					December		
	8	15	22	30	2	9	16	23	1	8	15	22	29	5	12	19
Project R&D																
Empathize		X														
Background	X	X														
Prototyping																
Testings																
Deliverables																
Progress Reports	X	X														
Prelim presentation																
Final Poster																
Meetings																
Client	X															
Advisor																
Website																
Update	X	X														

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

We completed the draft of our product design specification (PDS) and are now awaiting feedback from our advisor. Conducting background research for the PDS really helped our team understand the project's requirements and allowed us to get a better understanding of what we are trying to accomplish this semester.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Josh Slager	9/14/26	Team Meeting	1	4	7.5
	9/15/2026	Research for the PDS	1		
	9/17/2026	Wrote my section of the PDS	1		
		Editing the PDS	1		
Charlie Fischesser	9/14/2026	Team Meeting	1	4.5	7.5
	9/16/2026	Worked on PDS	1.5		
	9/17/2026	Continued work on PDS	1		
	9/17/2026	Research	1		
Christian Dittmar Greaves	9/14/2026	Conducted a qualitative market validation with an EMT	1.5	2.5	5.5
		Meeting with team	1		
Johnny Sellers	9/11/2026	BSAC meeting	1	3	4.5
	9/16/2026	PDS section research and writing	2		
Sam Wallin	9/14/2026	Continuing Background research	1	4.5	6.5
	9/14/2026	Completing training modules	1		
	9/14/2026	Team meeting	1		
	9/16/2026	PDS Section	1.5		
Jonas Zhang	9/14/2026	Team meeting	1	2.5	4.5
	9/15/2026	PDS Section	.5		
	9/16/2026	Continuing training	1		

Current design:

No current design to report.

BME Design: 200, 300, 301, 400 and 402

Materials and expenses:

No expenses to report.