

Progress Report #2

Title: Helmet for continuous laryngoscopy with exercise

Date: 09/17/2026

Client: Mr. Jacob Tangney MS, CCC-SLP

Advisor: Dr. Randolph Ashton, PhD

Team:

Evan Zheng, BME 300 - Team Leader

Hangjay Liu, BME 300 - Communicator

Joseph Hegeman, BME 200 - BSAC

Kavin Yedlapalli, BME 200 - BWIG

Katherine Fletcher, BME 200 - BPAG

Reghan Ziegler, BME 200 - BWIG

Problem Statement

Patients with induced laryngeal obstruction (ILO) require continuous laryngoscopy during exercise to observe the airway when the symptoms occur. However, current systems designed for securing the laryngoscope can be unstable, uncomfortable, and difficult to adjust causing device movement, poor/obstructed image quality, and difficulties during testing. In addition, there is no standard helmet for CLE procedures and all current helmets are custom made. Thus it is important to create a helmet that is able to securely stabilize the laryngoscope while accommodating different forms of exercise and a wide range of patient head size in order to help clinicians obtain reliable images.

Brief Status Update

The team completed the PDS, talked about possible designs, and went over some competing designs. We got a physical example of a wrestling helmet to have a design idea revolved around the helmet. The team recently met with the client and secured a recurring meeting and proposed a time to see the laryngoscope and get its dimensions. We will get back together next week and start finalizing our design.

Difficulties / Advice / Requests

Current Designs :

Materials and expenses - N/A

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total
Category 1									
									\$0.00
									\$0.00
Category 2									
									\$0.00
									\$0.00
								TOTAL:	\$0.00

Major team goals for the next week

1. Brainstorm more ideas and create a design criteria for selection
2. Complete design matrix and decide on a design to go forward with
3. Begin planning for fabrication

Next week's individual goals

- Evan Zheng
 - Brainstorm more ideas, establish a design to begin prototyping.
 - Complete more research
 - Plan testing procedures and logistics
- Hangjay Liu:
 - Start fabricating process
 - Do more research on more designs currently on the market
 - Schedule a time for the team to get their hands on the laryngoscope
- Joseph Hegeman
 - Explore different mounting systems: rail, straps, etc.
 - Find exact specifications on the laryngoscope used in the clinic.
- Kevin Yedlapalli
 - Come up with some potential design ideas for the mount and sketch them out
 - Implement designs in cad software
 - Research into more competing designs and get inspiration from them

- Katherine Fletcher
 - Start rendering possible holding designs for the laryngoscope
 - Start working through the weight displacement on the helmet and ideal methods of attaching the scope to a wrestling helmet
- Reghan Ziegler
 - Design at least three preliminary designs with explanations and limitations
 - Additional research into different materials that are breathable, lightweight, and easy to clean while maintaining structural integrity and resist possible residue forming issues such as mold
 - Figuring out different designs for a wrestling helmet and current testing already done

Timeline

Task	Sept			Oct					Nov				Dec	
	11	18	25	2	9	16	23	30	6	13	20	27	4	11
Project R&D														
Empathize	X													
Background...		X												
Prototyping														
Testings														
Deliverables														
Progress Reports	X	X												
Prelim presentation														
Final Poster														
Meetings														
Client		X												
Advisor	X													
Website														
Update	x													

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Evan Zheng
 - Researched about forces applied to the legs and head during different levels of exertion when sprinting
 - Researched antimicrobial materials suitable for construction of a clinical laboratory use product
 - Wrote the Function, Performance, and Materials section of the PDS
 - Brainstormed ideas with the team and established a clear direction
- Hangjay Liu
 - Research on standards that can be applied to our helmet design and putting that info into our PDS file
 - Reached out to client and secured a meeting with him
 - Looked for patents and related designs
 - Worked on PDS
- Joseph Hegeman

- Worked on PDS
- Attended client meeting
- Discussed PDS with team during team meeting
- Attended BSAC meeting
- Researched competing designs
- **Kavin Yedlapalli**
 - Research into some competing designs
 - Take inspiration from and generate new ideas on how to make the helmet system more secure, easier to use, and more comfortable
- **Katherine Fletcher**
 - Further research into testing for ILO/VCD and how different the different diagnosing techniques are
 - Research on age ranges of patients and how methods of testing and the results differ between older and younger patients
- **Reghan Ziegler**
 - Researched conditions that could lead to requiring the laryngoscopy and other conditions that could be related for potential complications
 - Make a list of possible designs and flaws that could be okay

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Evan Zheng	9/17/2026	Research, coordinate team, meet with advisor, typed and revised PDS.	4	10	14
Hangjay Liu	9/17/2026	Research standard/patents, Met with advisor/client, worked on PDS.	4	6	10
Joseph Hegeman	9/17/2026	Research on laryngoscope, PDS sections on weight, appearance/aesthetics, and service life, client meeting, team meeting	1	4	5
Kavin Yedlapalli	9/17/2026	Researched competing designs. Worked on multiple sections of PDS. Attended group meeting	4	3	7
Katherine Fletcher	9/17/2026	Met with advisor/client, start sketching possible designs, more research for ILO/VCD	4	5	9
Reghan Ziegler	9/17/2026	Met with advisor, met with client, started design ideas, researched additional information on materials and fabrication of said materials, worked on PDS	4	5	9