

Progress Report #7

Title: Helmet for continuous laryngoscopy with exercise

Date: 10/15/2026

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

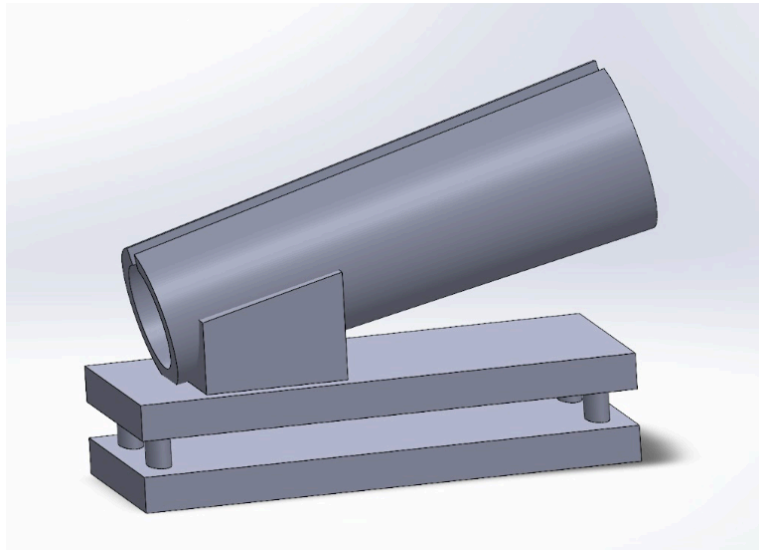
Continuous laryngoscopy during exercise (CLE) is the gold standard diagnostic tool to assess exercise induced laryngeal obstruction (ELIO). In order to observe the laryngeal obstruction, CLE is performed by attaching a laryngoscope to a head mounted apparatus which is inserted into the patient's nose and into the larynx. The patient would sprint or use a stationary bike at 50% and 100% exertion during the laryngoscopy. Currently, there is no single standardized helmet for CLE testing and all current helmets are custom made. To design a successful helmet for CLE, the laryngoscope mount must resist 6N of force and a $1.5\text{N}\cdot\text{m}$ moment applied in all directions. During full sprint, the laryngoscope must not move more than 5mm from its original position relative to the helmet and must not apply a moment greater than $30\text{N}\cdot\text{m}$ on the occipital condyle in both flexion, extension, and bending. Lastly the helmet must not slip and thus rotate relative to the patient's head more than 10 degrees from its initial wear position.

Brief Status Update

The team has received 1 helmet, the other 2 are sent to the wrong location. Will need to wait for them to get relocated so we can pick them up.

Difficulties / Advice / Requests

Current Designs : The angle cone mount will be mounted onto the mount area on the airsoft helmet.



Materials and expenses - N/A

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total
Category 1 Helmet									
Tactical Helmet	Airsoft Helmet with Side Rails and NVG Mounts for Outdoor Activities Such As Airsoft, Paintball, CS Games, Etc.	GVAKVTGK						\$23.96	\$23.96
Climbing Helmet	Half Dome Rock Climbing Helmet, Adjustable Fit, Ventilated	BLACK DIAMOND						\$69.95	\$69.95
Wrestling Helmet	Wrestling Headgear	Amazon Generic						\$69.95	\$69.95
Category 2 Mount									
									\$0.00
									\$0.00
								TOTAL:	\$0.00

Major team goals for the next week

1. Obtain Helmet, print out prototype and mount them onto the helmet
2. Fabricate the mounts
3. Attach it on to the helmet
4. Test for fit and durability
5. Get clearance out of the way so we can visit Dr. Green's facilities

Next week's individual goals

- Evan Zheng
 - Pick up the helmets from the clinic
 - Fabricate the mounts and mount them on the helmet
 - Contribute my portion of testing by sprinting with it on.
- Hangjay Liu:
 - Obtain Helmet
 - Print out prototype start testing
 - Complete required engineering training.
- Joseph Hegeman
 - Continue to learn SolidWorks
 - Get vaccinated for influenza to be certified to observe exercise tests.
 - Contribute to testing by sprinting with helmet/mount on.
 - Help with mounting and data taking
 - Complete required engineering training.
- Kavin Yedlapalli
 - Print out phone mount and begin initial testing for helmets
 - Start fabrication of actual mount
 - Complete required engineering training.
- Katherine Fletcher
 - Help with mounting the mount onto helmet
 - Contribute to testing
 - Learn CAD
- Reghan Ziegler
 - Finish materials training
 - Continue learning Solidworks
 - Complete required engineering training.
 - Continue physical designs for phone mount

Timeline

[illegible]

Progress Reports	X	X	X	X	X	X	X							
Prelim presentation				X										
Final Poster														
Meetings														
Client		X	X											
Advisor	X	X	X	X	X	X	X							
Website														
Update	x	X	X	X	X	X	X							

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Evan Zheng
 - Begin fabrication plan
 - Finalize cad
- Hangjay Liu:
 - Fixing old prototype CAD design
 - Research head muscle fatigue mechanism and ventilated vs non-ventilated helmet
 - Client meeting
- Joseph Hegeman
 - Learn SolidWorks
 - Draft mount designs based on current design.
- Kevin Yedlapalli
 - Learn solid works
 - Begin to fabricate/print out testing/phone mount
 - Complete required trainings
- Katherine Fletcher
 - Begin mount renderings
 - Start to lay out financial plans
- Reghan Ziegler
 - Continued learning Solidworks
 - Designed a mount for a phone on a helmet (this needs to be refined yet)

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Evan Zheng	10/22/2026	BME required training, Advisor meeting, fixing issue with helmet(only received one)	47	5	52

Hangjay Liu	10/22/2026	Advisor meeting, small change to CAD models	41.5	2.5	44
Joseph Hegeman	10/22/2026	Played around with SolidWorks, reviewed vaccination status for observing exercise tests.	26	2	28
Kavin Yedlapalli	10/22/2026	Completed required BME trainings and continued designing/developing helmet phone mount	29	8	37
Katherine Fletcher	10/22/2026	Begin training in Solidworks. PLayer around with onshape renderings. Attend a zoom meeting with Dr.Green.	22	4	26
Reghan Ziegler	10/22/2026	Continued training in Solidworks, kept on designing a new mount without CAD, started paying around with CAD, attended meeting with Dr. Green	28	4	32