

Title: Adaptive overhead tether system for freely moving swine

Team: Porcine Innovations Group (P.I.G.), BME 200/300

Date: 9/25/2026 - 10/1/2026

Client: Dr. Marco Failla Mulone

Advisor: Dr. Jonathan Soucy

P.I.G

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Problem statement

The UW-Madison Department of Neurosurgery is developing a chronic large-animal neuromonitoring platform using multiple intracranial catheters for continuous or repeated brain interstitial fluid sampling. A cranial fixation device that organizes and protects these catheters has already been developed; however, the lab requires the development of a complementary overhead system that manages tubing and cables extending from the cranial device, while simultaneously allowing the animal to move naturally within a stationary enclosure. The developed system needs to be able to dynamically follow the animal, maintain appropriate tubing length, minimize tensile and rotational forces, prevent entanglement or kinking, and allow normal behaviors.

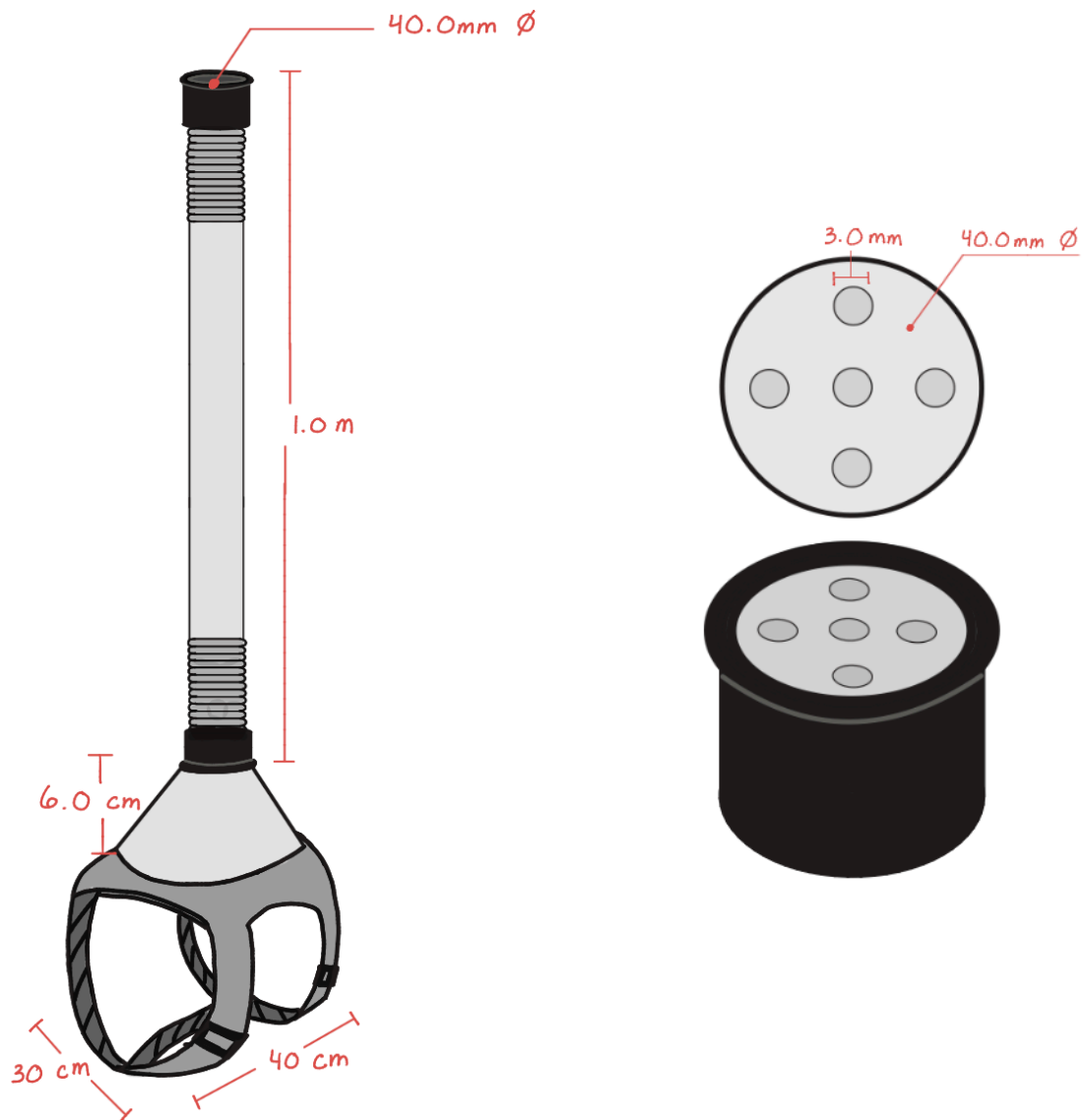
Brief status update

This week, our team focused on developing a preliminary design presentation. We also updated our matrices and reevaluated design criteria to ensure our final design was well thought out. To accompany the presentation, our team is also working on a written report that provides more detail on the information shown. We present on 10/02 and will be in contact with our client to go over the next steps within the project.

Difficulties/advice requests

N/A

Current design



Materials and expenses

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

Goals

Major team goals for the next week

1. Meet with the clients to get approval and feedback on the final design idea
2. Make a plan for fabrication and divvy up team roles for fabrication
3. Finish the Preliminary Report

Next week's individual goals

- Alisha Schaeffer
 - Assign team roles for the final design
 - Begin Fabrication of the final design
 - Finish Preliminary Design Evaluation on the Preliminary Report
- Katelynn Johnson
 - Begin fabrication plans for the final design
 - Finish the preliminary report
- Gabriela Medina Medina
 - Finish testing and results, discussion, and conclusion on the Preliminary report
 - Plan testing of final design
- Evan Hoffman
 - Work on deciding materials and methods to start building prototype
 - Start to create fabrication plan for prototype
- Catherine Sit
 - Finish preliminary report
 - Research specific materials and parts in fabrication of final product
- Joshua Grauman
 - Finish parts of the Preliminary Report
 - Research other preexisting designs that resemble our final product

Timeline

Task	September				October					November				December	
	10	16	18	25	2	7	16	23	30	6	20	26	30	4	9
Project R&D															
Empathize	X	X	X	X											
Background	X	X	X	X											
Prototyping															
Testings															
Deliverables															
Progress Reports	X	X	X	X	X										
PDS		X	X	X	X										
Design Matrix			X	X											
Prelim Presentation				X	X										
Prelim Deliverables					X										
Show and Tell															
Final Poster															
Final Deliverables															
Meetings															
Client		X													
Advisor	X	X	X	X	X										
Website															
Update	X	X	X	X	X										

Filled boxes = projected timeline

X = task was worked on or completed

Detailed accomplishments

Previous week's goals and accomplishments

The team used the three design matrices to finalize the tether and harness system to move forward with. They evaluated the qualities of the individual parts as well as their integration in the larger idealized final project design. The team also put together their preliminary presentation to present to their advisor and clients.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Alisha Schaeffer	9/22/2026	Sketched Brainstormed Design Ideas	1	4.5	16.5
	9/23/2026	Reviewed PDS comments and made edits	0.5		
	9/23/2026	Worked with team to revise design ideas and finalize the choices for the preliminary design matrices	1.5		
	9/24/2026	Sketched out the choices for the design matrices and helped evaluate each design matrix	1.5		
	9/27/2026	Worked on the Design Matrices	1.5	6	
	9/30/2026	Worked on the Slides for the Preliminary Presentation	0.5		
	10/1/2026	Practiced for the Preliminary Presentation	2		
	9/30/2026	Researched Background and Motivation for the project include in the slides	2		
Katelynn Johnson	9/18/2026	Researched required medical equipment	1.5	5.5	17.5
	9/23/2026	Worked on initial designs	1		
	9/24/2026	Reviewed PDS comments and made edits	0.5		
	9/24/2026	Worked on design matrices	2.5		
	9/27/2026	Worked on design matrices	1.5	6	
	9/29/2026	Worked on final design draft	1		
	9/30/2026	Worked on final design draft	0.5		
	9/30/2026	Worked on the preliminary presentation	1		
	10/1/2026	Worked on the preliminary presentation	2		
Gabriela Medina Medina	9/21/2026	Researched more competing designs & standards for PDS	2	5	15.25

	9/23/2026	Worked on initial designs	3		
	9/24/2026	Sketched out fixed-point swivel platform system & the flexible steel cover tether designs for design matrixes	1		
	9/27/2026	Worked out on design Matrixes	1		
	9/30/2026	Worked on Preliminary Slideshow	2		
	10/1/2026	Worked on Preliminary Slideshow & practiced	2		
Evan Hoffman	9/24/2026	Researched current devices and worked on initial design sketches	2	2	7.5
	9/27/2026	Worked on design matrices with team	1	3	
	9/29/2026	Worked on preliminary presentation, researched competing patents	2		
Catherine Sit	9/22/2026	Sketched design for swine harness	1.5	2.5	7.75
	9/24/2026	Drew an updated design for Swine Harness with more specifications	1		
	9/27/26	Worked on design matrices	1.5	3	
	9/28/26	Worked on presentation, researched competing designs	1.5		
Joshua Grauman	9/22/26	Sketched two basic designs of “Tether system” and “Piggyback”	1		11.5
	9/23/26	Reviewed PDS comments and generated matrices w/ group	1.5		
	9/24/26	Sketched Steering wheel platform	.5		
	9/27/26	Met with group and re-evaluated design matrices	1.5		
	9/30/26	Worked on presentation, contacted client, went over presentation with group	1.5		
	10/1/26	Fixed Equipment Platform Design Matrix and went over presentation	1		