

Title: Adaptive overhead tether system for freely moving swine

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

Date: 10/9/2026 - 10/15/2026

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 tether and harness 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

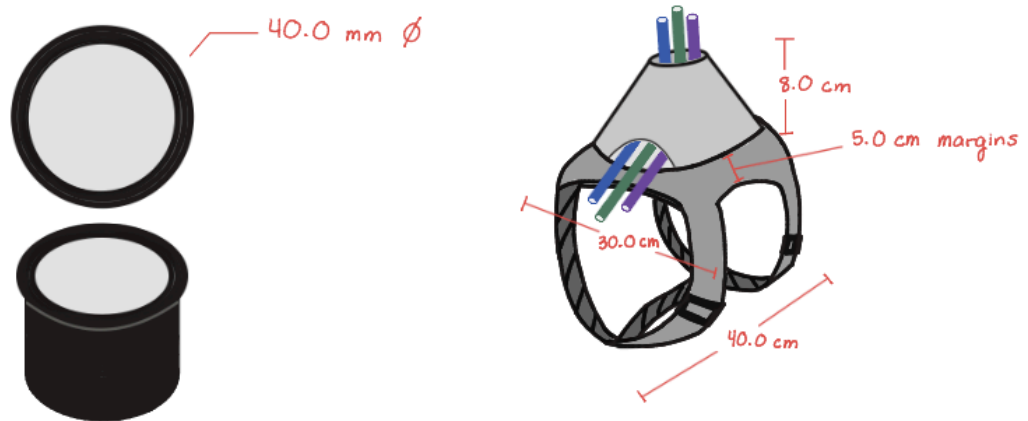
- ❖ Last week, we were able to gather more specific information about the surgical procedure of catheter installation by having two of our group members, Alisha and Katelynn, attend the operating room where the procedure was taking place. This allowed us to see, firsthand, how the procedures go, even if it wasn't on the specific swine variant they plan on using.
- ❖ We were then also able to meet with Dr. Mulone and Dr. Siler to discuss the preliminary presentation and report. We cleared up some lingering questions, and they decided that it would

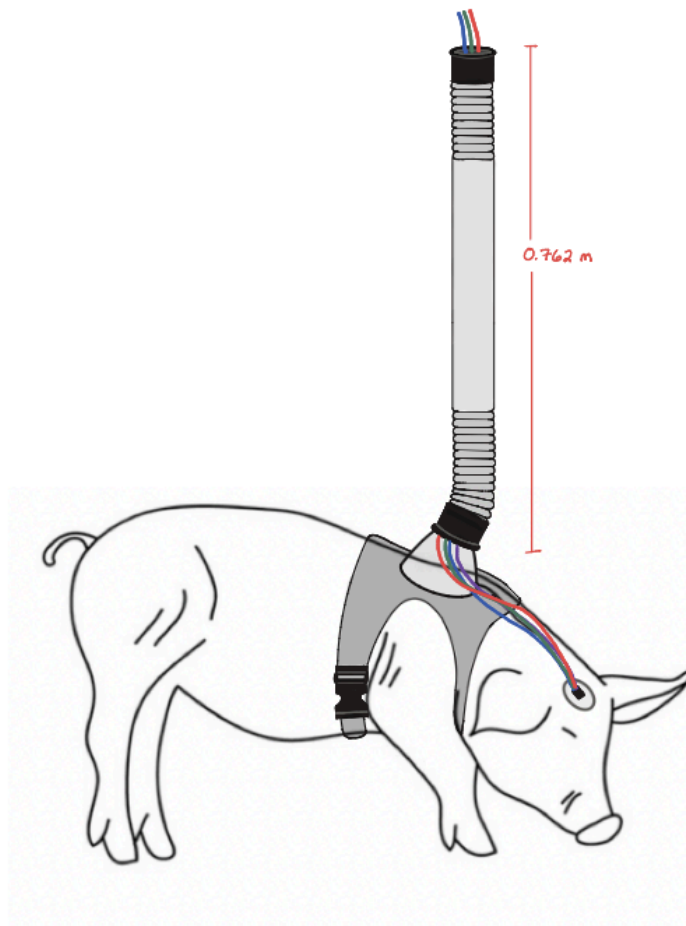
be more efficient if we (P.I.G.) designed a tunneling system on top of the animal rather than them trying to tunnel within the pig.

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. Configure a prototype of the tether system
2. Purchase materials to add to prototype
3. Get in contact with the veterinary staff that has access to the swines

Next week's individual goals

- Alisha Schaeffer
 - Help make a Proof of Concept Prototype
 - Come up with questions for the meeting with the Swine Laboratory Researcher
 - Research materials to design the head to tether wire protection
- Katelynn Johnson
 - Continue prototyping
 - Develop the show and tell presentation model
- Gabriela Medina Medina
 - Continue prototyping
 - Research about swine head movement
- Evan Hoffman
 - Get harness ordered from client
 - Prototype methods to join head and neck catheters
- Catherine Sit
 - Continue prototyping
 - Research swine harnesses and head coverings/attachments
- Joshua Grauman
 - Continue prototyping
 - Research materials and methods for protecting catheters from head to back

Timeline

[illegible]

Prelim Presentation				X	X										
Prelim Deliverables					X	X	X								
Show and Tell															
Final Poster															
Final Deliverables															
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

Detailed accomplishments

Previous week's goals and accomplishments

- ❖ Two of us were able to first-hand see the procedure occur
- ❖ Met with client(s) to discuss next steps (Brief Status Update has more info.)

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Alisha Schaeffer	10/11/2026	Worked on my sections of the Preliminary Report	2.5	10	28
	10/12/2026	Revised some of the preliminary report	1		
	10/13/2026	Watched a surgery of the insertion of wires and cardiac arrest experiment	5		
	10/14/2026	Went over some revisions to final design at the Client Meeting	1		
	10/14/2026	Created a document for questions and brainstormed some questions for meeting with Swine laboratory researcher	0.5		
Katelynn Johnson	10/11/2026	Updated design matrix drawings	1.5	8	31

	10/12/2026	Edited the preliminary report	2		
	10/13/2026	Edited the preliminary report	3		
	10/14/2026	Prepared questions for client meeting	0.5		
	10/14/2026	Updated final design sketch after client meeting.	1		
Gabriela Medina Medina	10/12/2026	Edited preliminary report	0.5	4	22.25
	10/13/2026	Updated PDS	2		
	10/13/2026	Edited preliminary report	1		
	10/14/2026	Prepared questions for client	0.5		
Evan Hoffman	10/9/2026	Materials and fabrication research and working on report	2	3.5	14
	10/12/2026	Modeling prototype and looked into limits of catheters	1.5		
Catherine Sit	10/11/26	Worked on preliminary report	1	4.5	14.75
	10/13/26	Finished section on preliminary report	2.5		
	10/14/26	Client meeting	1		
Joshua Grauman	10/09/26	Discussed with the group fabrication materials for the prototype	1	5	19.5
	10/11/26 10/13/26	Finished part of preliminary report	3		
	10/14/26	Met with client to go over presentation	1		