

Title: Reusable 3D pelvic floor teaching model for layered construction activities (Super-Models) 200/300

Date: 10/10/2026 - 10/16/2026

Client: Kelsey Henriquez

Advisor: Prof. David Dean

Team:

Katherine Ahlquist (kahlquist@wisc.edu) - Co-Team Leader

Sara Mlodik (mlodik@wisc.edu) - Co-Team Leader

Mina Hawkins (mjhawkins@wisc.edu) - Communicator

Abigayle Chapman (akchapman2@wisc.edu) - BWIG

Hiba Shah (hashah2@wisc.edu) - BPAG

Karen Pisano (kpisano@wisc.edu) - BSAC

Problem statement

The Physician Assistant anatomy curriculum currently has a pelvic floor anatomy workshop that uses a 2-dimensional paper template of the bony pelvis, on which PA students build pelvic floor musculature and tissues using colored Play-Doh. While the activity promotes hands-on learning, the 2D model does not adequately allow students to develop the three-dimensional spatial relationships required for future clinical practice. The client needs a classroom set of pelvic outlet models that accurately represent the normal adult pelvic anatomy, including anatomical landmarks for muscle and ligament attachment, that can serve as a stable scaffold for students to build pelvic floor musculature. It should be durable enough for repeated classroom use, easy to assemble and store, and allow Play-Doh or another inexpensive modeling material to be adhered and removed without causing residue or degradation.

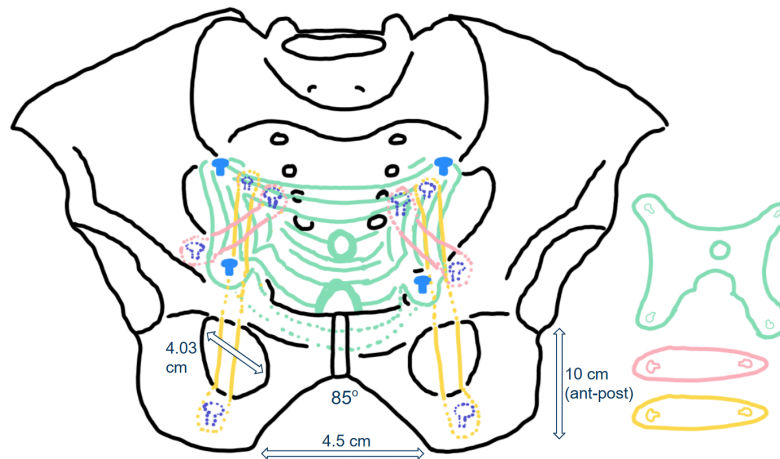
Brief status update

We completed our preliminary report and shared it with our clients and advisor, as well as posting it on our website. We held a meeting with our clients to present our final design ideas, during which we finalized attachment points for the ligaments and pelvic diaphragm. We reached out to Dr. Puccinelli regarding funding for our project and potentially reserving a room for fabrication purposes. This week we will meet with Jesse Darley for a 3D-printing consultation. This week, we will each familiarize ourselves with CAD as we develop a digital model of our prototype. We will also work on completing our individual training and uploading documentation to LabArchives before the October 30th deadline.

Difficulties / advice requests

N/A

Current Design



In the Pegs with Attachments design, there are 6 pieces total: a 3D printed pelvis, a flexible pelvic diaphragm, 2 flexible sacrospinous ligaments, and 2 sacrotuberous ligaments. The outer surface of the model will be coated with matte Mod Podge spray, allowing for better Play Doh adhesion onto the 3D printed surface. The pelvis is a simplified model, with the iliac crest sections superior to the proximal end of the sacrum removed. To allow the attachment of the diaphragm and ligaments, there are pegs on the pelvis surface. To address the lower longevity score, the attachment pegs will be metal semi-tubular rivets reinforced with adhesive to withstand repeated use without snapping under grip forces up to 624 N. Each rivet features an exposed neck for removable attachments and a stem deeply embedded into a matching socket and secured with cyanoacrylate adhesive to distribute lateral loads and prevent failure. Each of the flexible ligaments and diaphragm will have attachment holes at the ends with a wide and a narrow section to allow application and removal of the structures from the pegs. The diaphragm will be shaped like an 'X', having 4 attachment sites on each corner, as well as an inlet and a hole to allow students to scaffold the male or female anatomy. Finally, all structures will adhere to an average of male and female anatomical dimensions, creating a gender-neutral multi-piece pelvis model.

Materials and expenses

Prospective Materials and Expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
3D-Printed Scaffold										
Main body of pelvic model	3D printed using PLA from the UW Madison Makerspace	UW Madison Maker space	N/A	N/A	N/A	10/06.2026	30	5	150	N/A
Rivets	360 rivets needed for 30 models' ligament attachment sites. 8 50 pks needed.	Uxcell	N/A	Amazon	N/A	10/06.2026	8	5.36	42.88	Link
Modpodge	The entire outer surface requires coating.	Modpodge		Plaid	SKU 1469	10/06.2026	3	7.79	23.37	Link
Gorilla Glue	Used to secure 360 rivets into place	Gorrilla	N/A	Amazon	N/A	10/06.2026	2	8.98	17.96	Link
Pelvic accessories: Ligaments & Diaphragm										
TPU	3D printed using from the UW Madison Makerspace	UW Madison Maker space	N/A	N/A	N/A	10/06.2026	120	Awaiting Cost Estimate		N/A
							TOTAL		\$234.21	

Major team goals for the next week

- Finalize product and material design details based on 3D-Printing Consultation
- Have at least one functioning prototype for Show and Tell
- Calculate the specific costs of the required materials.

Next week's individual goals

- Katherine
 - Begin Fabrication for the ligament attachments
 - Create an inkscape file with finalized shapes of the ligaments.
- Sara
 - Complete the pelvis CAD model and 3D print the first models
 - Assist in designing and calculating the dimensions of the ligaments and diaphragm
- Mina
 - Establish ligament attachment points and sketch design.

- Finalize 2D pelvic floor muscle and ligament shapes in Adobe Illustrator and begin the laser cutting process.
- Assist in the fabrication of the first 3D printed model prototype.
- Abigail
 - Complete Pelvic Model STL modifications in OnShape, assist with printing
 - Assist with ligament design and development as needed
- Hiba
 - Request materials needed for prototype
 - Make changes to prototype after consultation if needed
- Karen
 - Modify the NIH .STL file using Onshape to create a digital prototype of our model
 - Finalize specific dimensions for each component of our model

Timeline

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

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Begin fabrication and narrow in on rivet, CAD, and material design details
- Have at least 3 functioning prototypes to show client

- Calculate the specific costs of the required materials

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Katherine	10/14	Meeting with team members to discuss the fabrication outlined by Jesse	.75	1.75	21.25 hr
	10/15	STL file exploration, investigating dimensions for ligament and diaphragm attachments	.5		
	10/15	Finding shapes for the ligament attachments that will be laser Cut	.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Sara	10/14	Attended with team members to discuss the fabrication outlined by Jesse	.75		19.7 hr
		Materials research...			
		Completed the in-person 3D printing training	0.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Abigayle	10/11	Solidworks Troubleshooting with Pelvis STL - Ultimately successfully simplified STL to an importable file, clarified pelvic dimensions, connected coccyx to sacrum	4	5	29.95 hr
	10/14	Attended design consultation meeting in Wendt	1		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Mina	10/11	Completed Feedback Fruits Reflection	2	7.5	27
	10/13	Completed Intro to Machining Required BME Training Canvas Course and reserved a lathe and mill.	2		
	10/14	Attended design consultation with Jesse and got ligament and pelvic floor muscle material and attachment ideas.	1		
	10/14	Design and sketch pelvic floor muscle attachment points using information learned from design consultation.	2.5		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Hiba	10/10	Finished all canvas course trainings	4		14.20

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Karen	10/11	Creating progress report #6	.5	2	21
	10/11	Making lathe reservations and finalizing training documentation	.5		
	10/11	Working on CAD in Onshape	1		
	10/11	Installing SolidWorks			