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

Date: 11/7/2026 - 11/13/2026

Client: Kelsey Henriquez
Advisor: Prof. David Dean
Team:
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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.

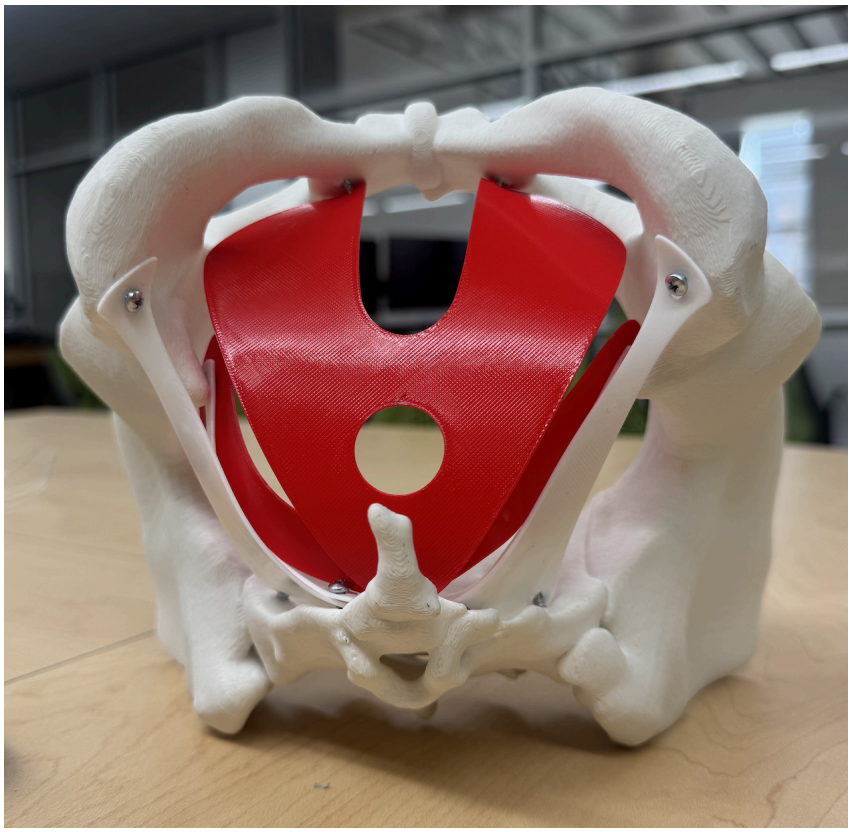
Brief status update

This week, the team met with the clients to verify that the current prototype of the model fulfills all their needs. After testing the current model, the clients approved the team to move forward with mass production of the pelvis models. The most recent ligament and pelvic diaphragm prototypes were tested and the dimensions were modified slightly to create the final ligament and pelvic diaphragm designs. The final ligament and pelvic diaphragm parts were printed in their respective colors. The team also began working on the final report, which has been divided evenly between the team members. The team attempted to start more prints at the Makerspace, but due to a website outage, the prints were not able to be started.

Difficulties / advice requests

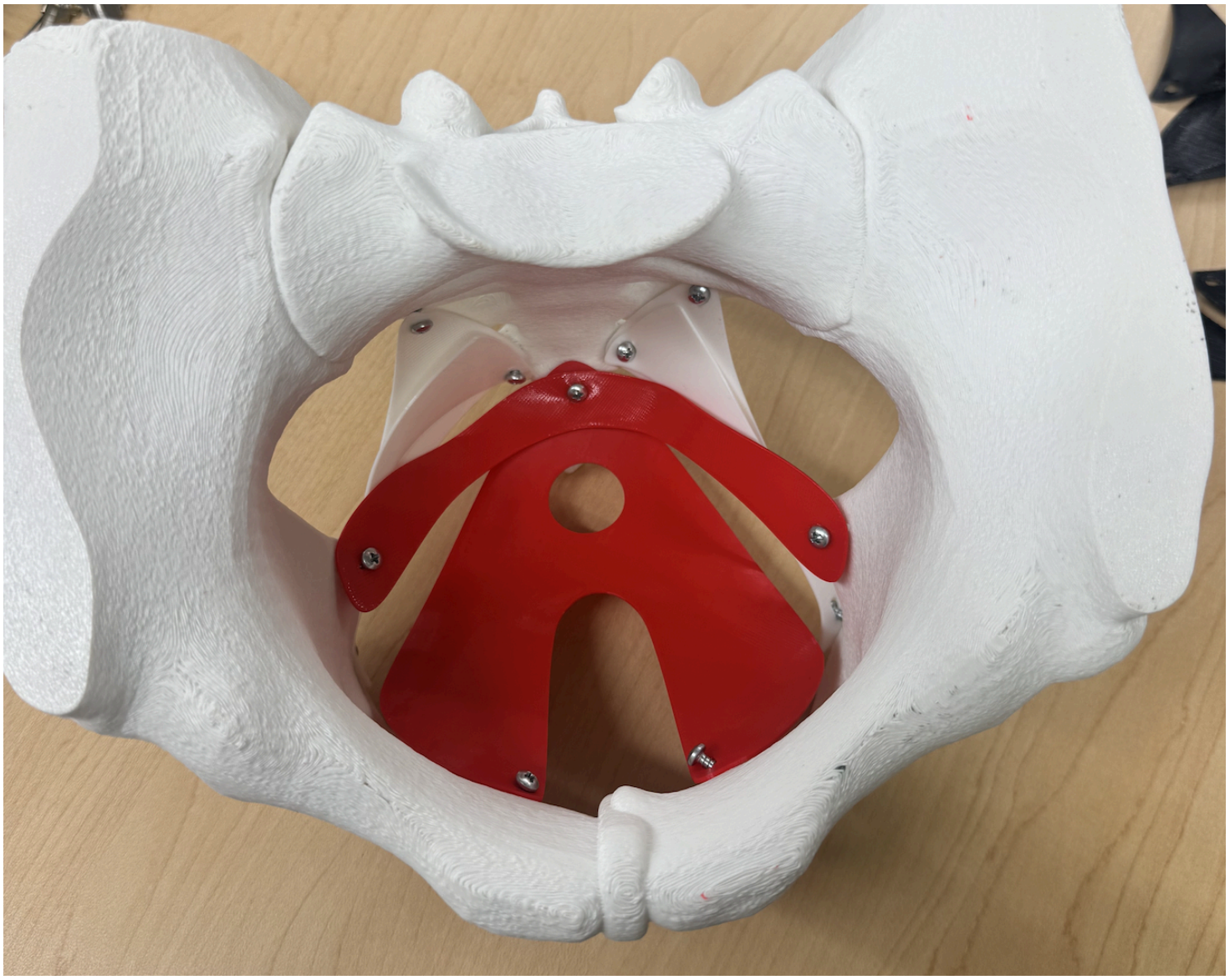
- **N/A**

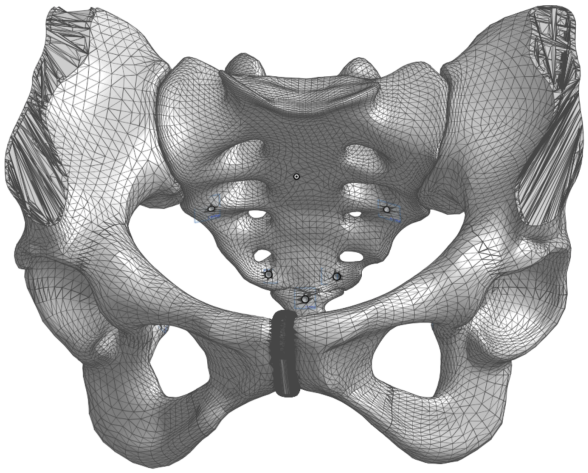
Current Design

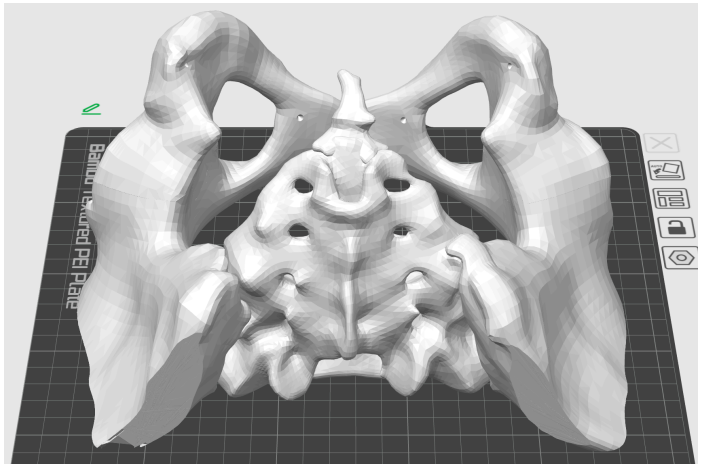




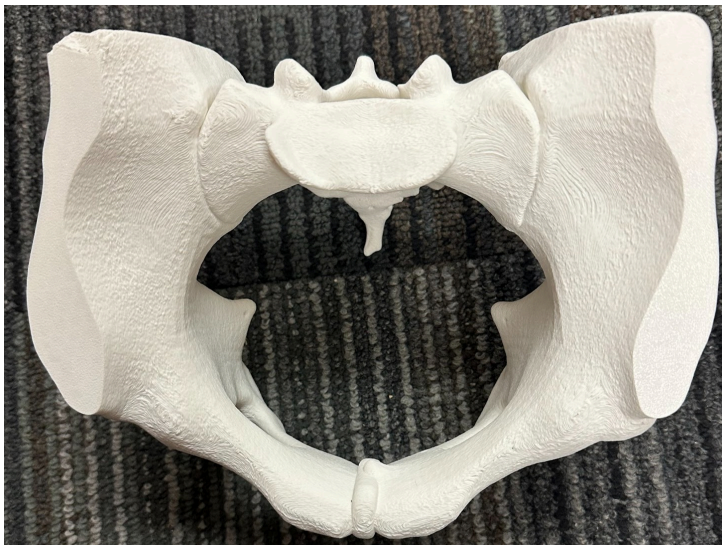






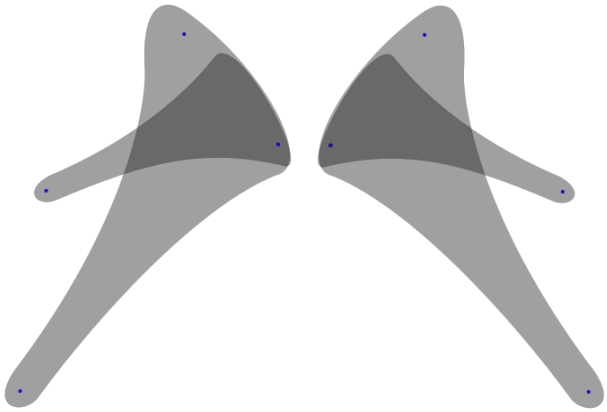


[OnShape 3D Model]

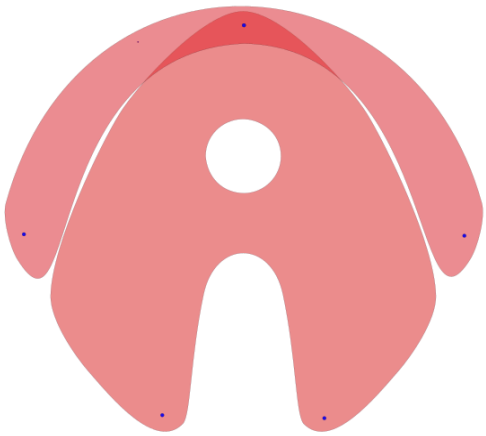


In the Screws with Attachments design, there are 7 pieces total: a 3D printed pelvis, a coccygeus muscle, a levator ani muscle, 2 flexible sacrospinous ligaments, and 2 sacrotuberous ligaments. The outer surface of the model will be coated with matte Mod Podge spray, allowing for better Play Doh adhesion 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 screws on the pelvis surface. To address the lower longevity score, the attachment sites involve self-threading screws, with future testing to ensure the screws are able to withstand repeated use without snapping under grip forces up to 624 N. Each of the flexible ligaments and musculature will have attachment holes at the ends with a wide and a narrow section to match anatomical shapes, as seen in the musculature attachment prototypes below. Finally, all structures will adhere to an average of male and female anatomical dimensions, creating a gender-neutral multi-piece pelvis model.

First prototype of musculature attachments:

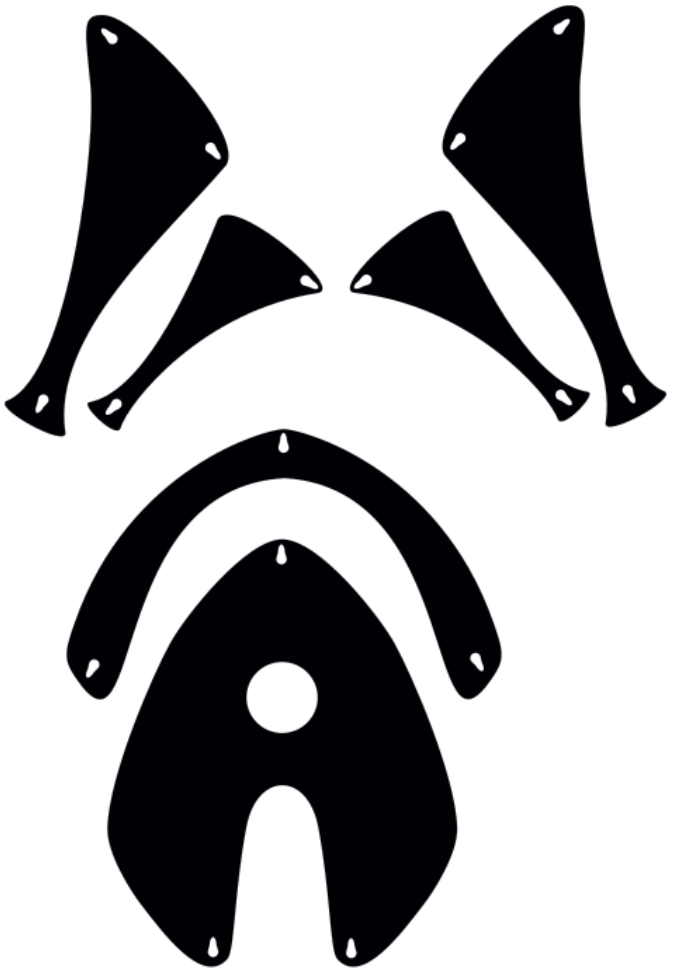


Sacrotuberous and Sacrospinous Ligament Dimensions

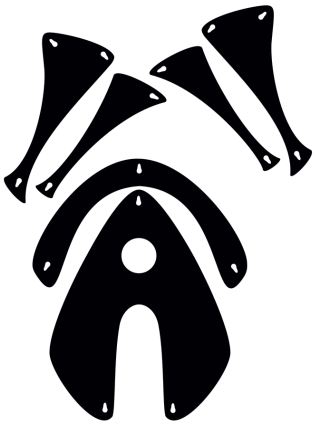


Levator Ani and Pubococcygeus Dimensions

Second Prototype of attachments:

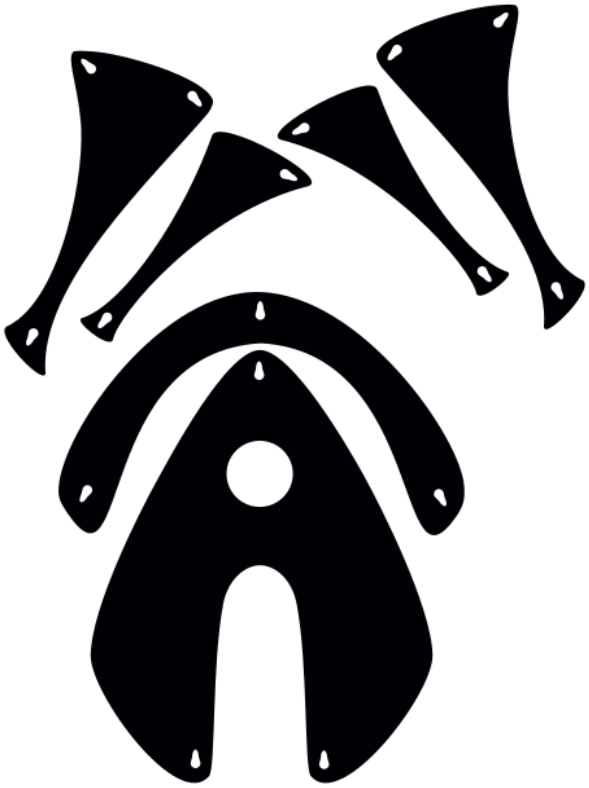


- Coccygeous: narrower, and shorter to get rid of slack.
- Levator Ani: slightly longer.
- Sacrotuberous ligament: slightly shorter and splayed out anchoring end.
- Sacrospinous ligament: same sizing, slightly splayed out anchoring end.



Third Prototype of attachments:

- Coccygeous: narrower, and shorter to get rid of slack.
- Levator Ani: slightly longer and wider to match how it should lay on the pelvis.
- Sacrotuberous ligament: top hole lower and changed angle of the splayed out end.
- Sacrospinous ligament: longer



Fourth and Final Prototype of attachments:

- Coccygeous: Same
- Levator Ani: Same
- Sacrotuberous ligament: Slightly Wider at coccyx attachment.
- Sacrospinous ligament: Shorter

Printed Prototype →



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	8.05	241.5	N/A
Screws	390 screws needed for 30 models' ligament attachment sites.	MoyoCodi	PTZG03 #312	Amazon	PTZG03#312.	10/20/2026	4	3.99	16	link
Modpodge	The entire outer surface requires coating.	Modpodge	1469	Amazon	1496	10/06.2026	3	10.18	30.54	Link
Pelvic accessories: Ligaments & Diaphragm										
TPU (red, black,white)	Printing ligaments with provided filament	UW Madison Maker space	N/A	N/A	N/A	10/25/26	30	0.50	15	N/a
	*$33 off makerspace left (total not subtracted yet)							**TOTAL***	303.04	

Major team goals for the next week

- Print as many models as possible
- Print as many sets of ligaments as possible
- Work on post-processing of models (attaching screws and removing 3D-print supports)
- Continue to work on Final Report

Next week's individual goals

- Katherine
  - Begin the prints for all 30 Models
  - Assist in fabrication of all 30 models
  - Final Poster Work
- Sara
  - Complete documentation for final report: 3D Pelvis Model Fabrication and Fabrication protocols
  - Begin working on the final poster
  - Assist in mass production of models
- Mina
  - Complete final report sections and update PDS
  - Assist in mass production of models
- Abigayle
  - Make progress on final report and any necessary documentation

    - Move forward mass production of models
    - Begin work on final poster
- Hiba
    - Do final report sections
    - Help with post fabrication (tree removals)
    - Do more testing and mass printing
- Karen
    - Finish my sections of the final report
    - Help with post-processing of 3D printed models
    - Start to work on final poster

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	x	x	x	x				
Testings							x	x	x	x				
Deliverables														
Progress Reports	x	x	x	x	x	x	x	x	x	x				
PDS		x	x	x	x	x	x	x	x	x				
Design Matrix			x											
Prelim Presentation				x										
Prelim Deliverables					x									
Show and Tell								x						
Final Poster														
Final Deliverables														
Meetings														
Client	x				x	x				x				
Advisor	x	x	x	x	x	x	x		x					
Website														
Update	x	x	x	x	x	x	x	x	x					

Filled boxes = projected timeline
X = task was worked on or completed

Previous week's goals and accomplishments

- Mass printing of 30 models
- Starting post fabrication of models (mod podge layering, screws, etc)
- 3D printing ligaments

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Katherine	11/9/2026	Client meeting	1	3.25	37.0 hr
	11/9/2026	Ligament fabrication and editing	.75		
	11/13	Final Prototype Testing – Updated Coccygeous	1		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Sara	11/6	Picked up prints for tree removal and created sections for the Final Report	1	3.25	51.95 hr
	11/9	Reviewed client meeting notes	0.25		
	11/12	Consolidated protocols into a cohesive and updated protocol for 3D modeling to be used in the Final Report	2		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Abigayle	11/8	Drop test on latest iteration of model, play doh adhesion check on latest surface modification	0.5	3.5	42.95 hr
	11/9	Attended client meeting for prototype feedback	1		
	11/10	Documentation/Final Report work	2		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Mina	11/6	Removing trees from 3D printed pelvis	0.5	2	42
	11/9	Attending client meeting to discuss pelvic floor muscles and ligaments	1		
	11/9	Printing pelvic floor muscle and ligaments	0.5		

		(red and white TPU)			

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Hiba	11/06	Did the post fabrication (tree removal) for the latest version of the model	1	2	41.45
	11/09	Meeting with client	1		

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Karen	11/09	Client Meeting	1	4.75	42.75
	11/12	Tried to start 3D Print (makerspace website went down)	1		
	11/12	Updating Progress Report	.75		
	11/13	Starting 3D Prints / Makerspace Questions	1		
	11/13	Updating LabArchives / Testing Current Model	1		