Bed-mounted Modular Procedural Training Surface

Date: 10/22/2026
Client: Shannon DiMarco
Advisor: Darilis Suarez-Gonzalez

Team:
Nathan Knight – Team Leader and BSAC (nknight3@wisc.edu)
Evan Koelemay – Communicator (ekoelemay@wisc.edu)
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Problem Statement:
A secure, lightweight, procedural workstation is crucial for clinical simulation centers to conduct procedural training. Current solutions leave much to be desired as they lack stability, take up excessive floor space, or exhibit tipping hazards. To resolve this, the team is being tasked with designing a modular workstation attachment to existing bed architecture. The workstation must be compact for storage, quickly attachable, and meet desired constraints for sanitation and safety.

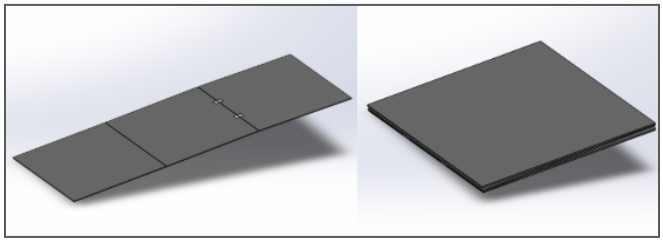
Brief Status Update:

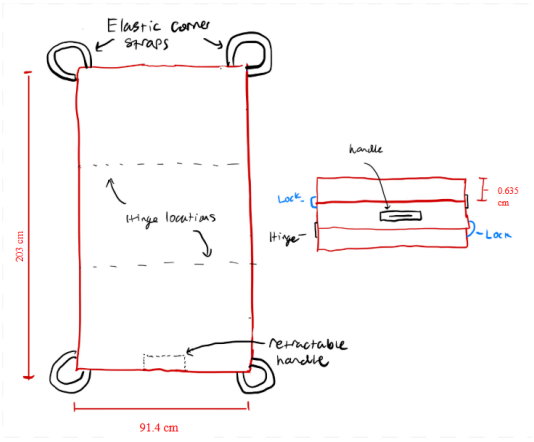
- This week, the team met in the design innovation lab to continue the fabrication process of the mini prototype. Piano hinges and straps were procured through the client. A mini prototype has been made for the show and tell, and the team prepared questions to foster feedback from other BME 400 teams.

Project Difficulties/Advice Requests:

- None to report

Current Design





The current design features three equal-sized panels, attached by piano joints in alternating directions to fold into one neat stack. In order to prevent fluid leakage, a thin silicone sheet will be placed over the entire surface, which will easily fold and stretch with the panels. The method of securing the surface to the mattress will be done with 4 elastic straps, one on each corner. These straps will easily slip under the corners of the mattress, preventing movement in all directions. This design will also feature a compact, retractable handle, allowing for briefcase-like carrying when in its folded state. Dimensions will be 36” (91.4cm) width, 80” (203cm) length, and ¼” (0.635cm) thickness.

Materials and Expenses:

Item	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Prototype									
Acrylic Sheets	Makerspace	n/a	UW-Madison	n/a	10/19/2026	1	$10.75	$10.75	n/a
Piano Hinges	XHMAX E Store	XHMAX E-8IN-BLACK-4 PACK	Amazon	B0B4DDWQNG	10/20/2026	4	$4.75	$18.98	link
Elastic Bands	Airisoer	192687523764	Amazon	B0869KZ9CT	10/23/2026	1	$6.49	$6.49	link
							TOTAL:	**$36.22**	

Team Goals for Upcoming Week:

1. Receive feedback from show and tell
2. Start developing the survey questionnaire for testing

3. Order material for chemically resistant cover

Individual Goals for Upcoming Week:

- Nathan Knight
    - Help group with creating our survey
    - Continue looking into ways the electrical component can be added
    - Work with the group to obtain any ordered materials
- Evan Koelemay
    - Keep in contact with client for further materials ordering for prototype
    - Research ways to improve faults in current design
    - Help write survey questions
- Tess Fitzgerald
    - Begin writing a survey questionnaire for testing
    - Order silicone or other mechanism for resisting chemical liquids
- Andrew McLaughlin
    - Order silicone and additional materials needed
    - Keep BPAG spreadsheet up-to-date
    - Assist in writing survey questions for testing

Timeline

Task	September				October					November				December		
	4	11	18	25	2	9	16	23	30	6	13	20	27	4	9	11
Deliverables																
Progress Reports		**X**	X	X	X	X	X	X	X							
PDS Draft			X													
Design Matrix				X												
Preliminary Presentations					X											
Preliminary Report						X										
Preliminary Evaluations						X										
Show and Tell									X							
Final Poster Presentation																
Final Lab Notebook																
Final Report																
Final Evaluations																
Meetings																
Team	**X**	**X**	X	X	X	X	X	X	X							
Client	**X**		X		X		X	X								

Advisor	**X**		X	X	X	X	X		X							
Website																
Update	**X**	**X**	X	X	X	X	X	X	X							

Previous week's goals and accomplishments:

- Nathan Knight
    - Obtain and continue fabrication with new parts
    - Meet with the client alongside the team
- Evan Koelemay
    - Meet with client to discuss further design considerations and ordering
    - Continue fabrication of prototype
- Tess Fitzgerald
    - Continue fabrication of mini prototype
    - Meet with client to discuss timelines and material ordering
    - Order strap and chemical resistance components of prototype
- Andrew McLaughlin
    - Continue to fabricate prototype
    - Meet with client to discuss timeline and material ordering
    - Continue to work on BPAG spreadsheet and collect necessary material

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Nathan Knight	10/28/2026	Worked on the hinge portion of the prototype and prepared thoughts for the show and tell event	1.5	1.5	16
Evan Koelemay	10/29/2026	Worked on prototype and researched possible mechanisms to better conceal hinges	2	2	19
Andrew McLaughlin	10/29/2026	Worked on prototype for show and tell	1	1	20
Tess Fitzgerald	10/29/2026	Prepared call to action for show and tell	1	1	20.5
Team	10/29/2026 10/28/2026	Team meeting in the design innovation lab where mini prototype was fabricated using shop tools	2.5	2.5	7