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)
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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.

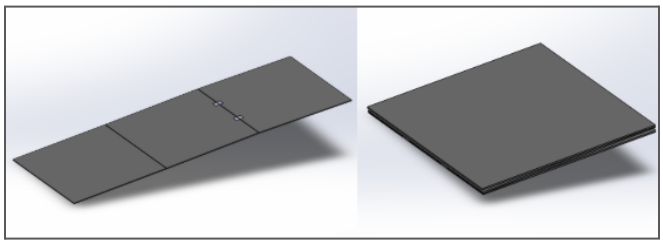
Brief Status Update:

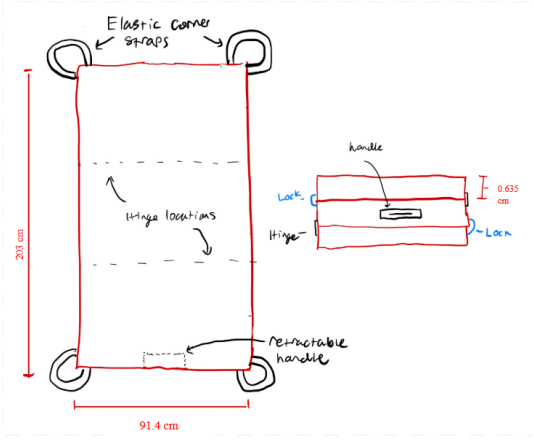
- This week, the team collectively met to set up the survey questions for students to evaluate and provide feedback on the design. Material ordering has begun for fabrication of the full scale design.

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	XHMAXE Store	XHMAXE-8IN-BLACK-4PACK	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
Final Design									
HDPE Sheet	APPROVED VENDOR Hardware	BULK-PS-PE-461	Grainger	55RX66	11/11/2026	2	**$126.69**	**$253.38**	link
							TOTAL:	**$289.60**	

Team Goals for Upcoming Week:

1. Obtain materials and begin fabricating the full scale model of our design
2. Meet with client to finalize material choices.

Individual Goals for Upcoming Week:

- Nathan Knight
    - Start fabricating the actual design
    - Meet with team and client to discuss testing plans, fabrication plans/adjustments if needed
- Evan Koelemay
    - Begin final fabrication
    - Research methods of hinge insertion
- Tess Fitzgerald
    - Begin final fabrication of full scale device
    - Create a plan/timeline for testing of the device
- Andrew McLaughlin
    - Begin working on fabrication of the design
    - Send over the survey to the client to get a better idea of sample size and if the questions make sense for the procedures being simulated

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

Previous week's goals and accomplishments:

- Nathan Knight
    - Further look into and plan out considerations given during show and tell
    - Update Labarchives with relevant deliverables completed
    - Continue working with team to obtain any parts to continue fabrication
- Evan Koelemay
    - Research possible materials for elastic hinge mechanism
    - Meet with client to discuss current design considerations
- Tess Fitzgerald
    - Research vendors for ordering large scale polypropylene sheets
    - Meet with advisor to discuss mechanisms for testing
- Andrew McLaughlin
    - Continue to look at different ways of purchasing materials
    - Continue fabrication and implementation of some of the ideas given at show-and-tell

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Nathan Knight	11/11/2026 11/12/2026	Met with the group to collectively work on the survey and discuss materials to order Update LabArchives to current status	1 0.5	1 0.5	20.5
Evan Koelemay	11/11/2026	Met with group to discuss final fabrication materials	1	1	21.5
Andrew McLaughlin	11/10/2026 11/11/2026 11/11/2026	Research on how and drafted survey questions Met with group to discuss material ordering and survey Updated BPAG sheet	.5 1 .5	2	23
Tess Fitzgerald	11/10/2026	Met with team to brainstorm survey questions and method for data analysis	1.5	1.5	23
Team					