

Knee Crutch

Date: 10/16/25

Client: Daniel Kutschera

Advisor: Randy Bartels

Team:

Violet Urdahl - Team Leader (vurdahl@wisc.edu)

Tess Fitzgerald - Communicator (tkfitzgerald@wisc.edu)

Aubrey Younker - BPAG (ayounker@wisc.edu)

Lauren Anderson - BSAC (ldanderson6@wisc.edu)

Kayla Christy - BSAC (kjchristy@wisc.edu)

Evan Koelemay - BWIG (ekoelemay@wisc.edu)

Problem Statement:

Knee crutches are an assistive device used to help non-weight-bearing patients recovering from a lower limb injury move efficiently and comfortably. Current devices available target assistance with walking, but are not suitable for ascending or descending stairs. To ensure patients can get home safely, the improved knee crutch will provide ample stability and assistance for stair climbing without the additional use of crutches. The goal is to create an improved version of an existing prototype that will provide users with sufficient mobility and stability when climbing stairs.

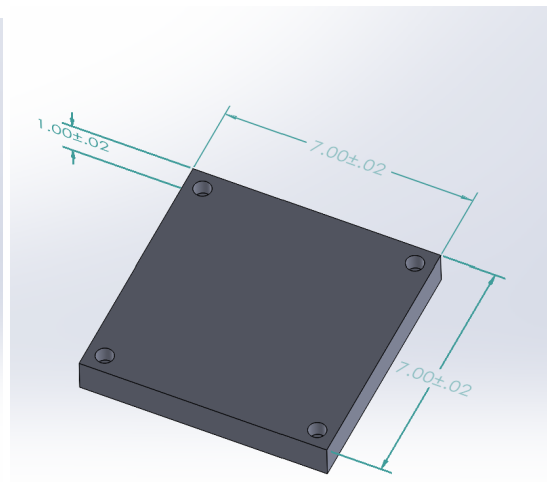
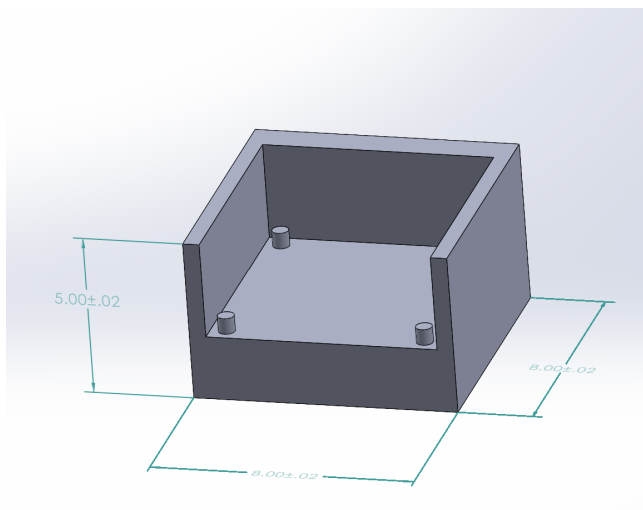
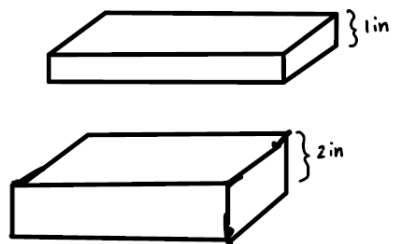
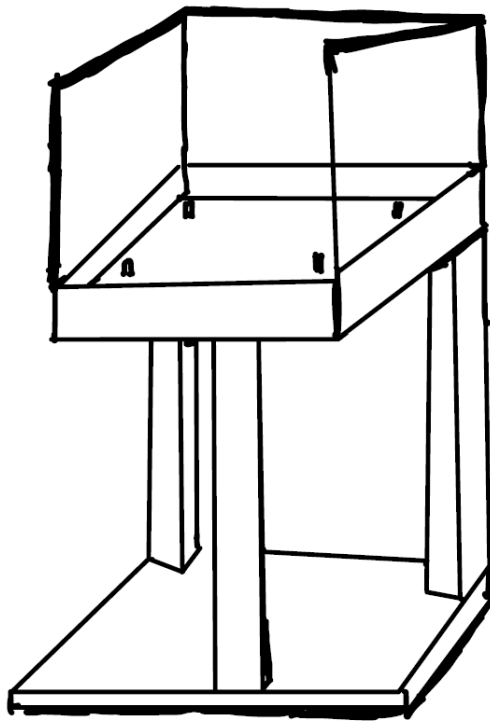
Brief Status Update:

This week the group was able to order materials for the base of the crutch. These arrived mid-way through the week, which allowed us to begin early stages of fabrication. Team members were also able to make notable progress on research and mandatory trainings.

Project Difficulties/Advice Requests:

- None to report

Current Design:



Materials and Expenses:

- See table below:

Item	Description	Manufacturer	Date	#	Cost Each	Total	Link
HDP	3D printing material for knee support	Makerspace	Have not purchased	N/A	N/A	\$0.00	
Extruded Aluminum Set with Connectors	Material for legs and knee support frame	Home Depot	Purchased on 10/10	1 set of 4 rods and connector sets	\$43.70	\$43.70	link
Memory foam cushion	Material for knee to rest directly on	TBD	Have not purchased	N/A	N/A	\$0.00	
Rubber base	Material for non-slip bottom base	Amazon	Have not purchased	N/A	N/A	\$0.00	
Additional Connectors for Extruded Aluminum rods	Set of 10 extruded aluminum rod connectors	Amazon	Purchased on 10/10	1 set of 10 connectors	\$12.99	\$12.99	link
					TOTAL:	\$59.80 with Tax	

Team Goals for Upcoming Week:

- Complete base fabrication
- Prepare elevator pitch for show and tell
- Order knee rest and handle materials

Individual Goals for Upcoming Week:

- Tess Fitzgerald
 - Order materials for knee rest
 - Prepare elevator pitch for show and tell
 - Fabricate base and legs
- Aubrianna Younker
 - Order materials for handle and knee rest and begin fabrication
 - Prep a prototype for show and tell

- Prepare an elevator pitch to propose
- Lauren Anderson
 - Order materials for handle and knee rest
 - Finalize the knee rest design
 - Prepare and elevator pitch and practice
- Violet Urdahl
 - Complete base fabrication
 - Prepare elevator pitch
- Kayla Christy
 - Finish my last Training through the curriculum course.
 - Research materials for the handle component of our design
 - Prepare elevator pitch for show and tell
 - Attend BSAC meeting
- Evan Koelemay
 - Complete online training
 - Prepare elevator pitch
 - Complete base fabrication

Timeline

Task	September				October				November					December	
	5	12	19	26	3	10	17	24	31	7	14	21	28	5	10
Deliverables															
Progress Reports		X	X	X	X	X	X	X							
PDS Draft			X												
Design Matrix				X											
Preliminary Presentations					X										
Preliminary Lab Notebook						X									
Preliminary Report						X									
Preliminary Evaluations						X									
Show and Tell															
Final Poster Presentation															
Final Lab Notebook															
Final Report															
Final Evaluations															
Meetings															
Team	X		X	X	X	X	X	X							
Client	X			X		X									
Advisor			X		X		X	X							

Website														
Update	X	X	X	X	X	X	X	X						

Previous week's goals and accomplishments:

- Tess Fitzgerald
 - Finalized base and leg fabrication plan
 - Brainstormed knee rest fabrication protocol
- Aubrianna Younker
 - Placed 2 orders for the materials needed for our base
 - Updated expense spreadsheet reflecting the most recent purchases
 - Estimated the weight of the base given our current design
 - Made group progress report
 - CITI Training Modules
- Lauren Anderson
 - Ordered the extruded aluminum that our team is using for the base
 - Researched the testing strategies we are planning to use
 - Explore important variables to keep in mind when testing
 - Attended the BSAC meeting
- Violet Urdahl
 - Ordered and received the extruded aluminum for the base
 - Finalized dimensions for the base components
 - Created a fabrication plan for the base
- Evan Koelemay
 - Completed lathe training (mill training will be completed shortly)
 - Prepared meetings to discuss/complete base fabrication
- Kayla Christy
 - Completed Mill, lathe, and biosafety training
 - Ordered extruded aluminum with the team for the base and handle components of our prototype
 - Updated LabArchives on the handle component.
 - Attend BSAC meeting

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Violet Urdahl	10/23/25	Ordered, received, and created	2	2	16.5

		dimensions for base component			
Aubrianna Younker	10/23/25	Ordering materials, design drawing for handle, progress report, and weight estimation	3h	3h	18h
Tess Fitzgerald	10/23/25	Confirmed materials and fabrication procedure for base	2	2	16h
Lauren Anderson	10/23/25	Ordering materials, research , and BSAC meeting	2.5	2.5	16h
Evan Koelemay	10/23/25	Training, meeting for base fabrication plan	2.5	2.5	15.5h
Kayla Christy	10/23/25	BSAC meeting, Ordering materials, research	3	3	19h
Small Group Meeting	10/23/25	Evan, Violet, and Aubrey met to plan for base fabrication next week	1	1	1
Whole Team	10/17/25		1h	1.5h	13h
Whole Team	10/17/25	Advisor Meeting	0.5h		