Knee Crutch

Progress Report #9

BME Design 200/300

Date: 10/30-11/5

Client: Daniel Kutschera
Advisor: Duc-Huy Nguyen
Team:

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Problem statement

Patients who are non-weightbearing on a lower limb often have difficulty safely navigating stairs when returning home, particularly when weakness or other physical limitations prevent them from using crutches. Current solutions are either improvised, uncomfortable, difficult to adjust, or designed for walking rather than stair navigation. Therefore, there is a need for a stable, adjustable, comfortable, and easily sanitized device that allows non-weightbearing patients to safely ascend and descend stairs without placing weight on the injured lower limb.

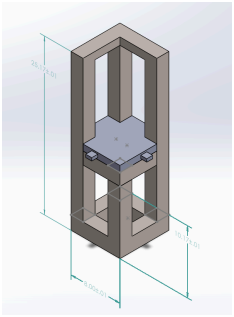
Brief status update

This week our team members finished up training. We had another meeting with an ecb shop advisor, Mike Hughes, who suggested a new fabrication plan for the already obtained H-bars.

Difficulties / advice requests

Should we have any sort of backup plan in case our design fails (due to connections) in testing?

Current design



Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
Al H-Beams	3ft long aluminum h beams; thickness: 0.05in; height: 1.074in; width: 1.040in	Unknown	Unknown	McMaster	4558t51	10/15/2026	6	$10.60	$79.33	https://www.mcmaster.com/4558T51/
									$0.00	
Category 2										
Knee cushion	knee cushion	etsy	-	etsy	-	10/21	2	14.76	$14.76	
Knee Cushion	Knee cushion upcharge	etsy	-	etsy	-	11/6		$6.00	$6.00	
								TOTAL:	**$0.00**	

Goals

Major team goals for the next week

1. Begin cutting and welding frame
2. Order handles, and cushion stuffing

Next week's individual goals

- Carmen Tanem
    - Hopefully get the materials cut and down into weld
        - This would mean we would have the final base!
    - Talk with the etsy seller to confirm shipping date
    - Lay out remainder of semester plan
- Katie Matheus
    - Start fabricating!
    - Look how to add handle and base, order
- Meghan Hayes
    - Weld materials
    - Meet with Mike
    - Look into additional materials and testing protocols
- Madeline
    - Start fabrication
    - Look into riser sizes as base is fabricated
- Zach
    - Look into alternative material shape
    - Determine what should be ordered for the handles, and how it will be added to the device
- Victoria
    - Begin fabrication on Tuesday by cutting materials
    - Begin fabricating base

Timeline

Task	N/A	Sept				Oct					Nov				Dec	
	N/A	3	10	17	24	1	8	15	22	29	5	12	19	26	10	17
Project R&D																
Empathize			X													
Background…			X	X	X											
Prototyping				X	X	X	X	X	X	X						
Testings																
Deliverables																

Progress Reports		X	X	X	X	X	X	X	X	X	X					
Prelim presentation						X										
Final Poster																
Meetings																
Client		X														
Advisor		X	X	X	X	X	X	X	X							
Website		X	X	X	X	X	X	X	X							
Update		X	X	X	X	X	X	X	X	X						

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

Detailed accomplishments

Previous week's goals and accomplishments

- Carmen Tanem
    - Order/fabricate base
    - Get feedback from show and tell
    - Meet with Mike before fabricating
- Katie Matheus
    - Get feedback from show and tell
    - Meet with Mike before fabricating
- Meghan Hayes
    - Figure out fabrication plan
    - Meet with Mike again
    - Order new materials if needed
- Madeline
    - Possible small scale model prototype
    - Discuss new plate with fabrication
- Zach
    - Continue Training
    - Incorporate feedback into design and fabrication plan
    - Discuss and order new materials
- Victoria
    - Continue Training
    - Discuss fabrication plan

Summary of Team Accomplishments

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Carmen Tanem					
Katie Matheus	10/30 11/5	Record feedback from show and tell -make game plan Machine shop meeting. Research materials to order	1 1	2	25.5
Meghan	11/5	Fabrication meeting	1.5	1.5	26
Victoria	11/01/2026 11/05/2026	Welding Training Fabrication timeline planning	1.5 0.5	2	28
Madeline					
Zach	11/4-5/2026	Began creating in depth testing plans	2	2	29