

Knee Crutch

Progress Report #2

BME Design 200/300

Date: 9/11-9/17

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 we started and finished our PDS, which will allow us to be put on the correct path for really kicking this project off. We had our first client and advisor meeting, and they both went very well. We are very excited to start brainstorming ideas to be able to bring to preliminary presentations.

Difficulties / advice requests

We are working through what our client has talked to us about, and are going to implement them into our design ideas

Current design

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
									\$0.00	
									\$0.00	
Category 2										
									\$0.00	
									\$0.00	
								TOTAL:	\$0.00	

Goals

Major team goals for the next week

1. Start researching and coming up with a big list of ideas that we can start ping ponging
2. Update the PDS as we go to make sure it stays up to date with our project
3. Draft up potential design ideas to bring to our next client and advisor meetings to get feedback

Next week's individual goals

- Carmen Tanem
 - Come up with a few design ideas to bring to advisor and client meetings
 - Research materials that we could use that fit clients needs
 - Update PDS to keep it up to date with changing client needs
- Katie Matheus
 - Brainstorm design ideas so we can start our design matrix
 - Research materials, sterilization techniques
- Meghan Hayes
 - Brainstorm preliminary design ideas
 - Research standards and specifications
 - Research materials
- Madeline
 - Begin early design brainstorming
 - weigh pros and cons of existing designs on the market
 - research ways to lower design weight
- Zach
 - Brainstorm design features to improve upon previous designs
 - Continue researching structural and high friction materials
 - Refine PDS as we become more familiar with specific client needs that may have changed from last year
- Victoria Kind
 - Continue researching competing designs and the medical reasons for needing this product
 - Create a design based on clients needs

Timeline

[illegible]

Website																
Update																

Filled boxes = projected timeline

X = task was worked on or completed

Detailed accomplishments

Previous week's goals and accomplishments

- Carmen Tanem
 - Research and gather information from the previous year to get a better understanding of how we can start
 - Kickoff the first BSAC meeting
 - Connect with the team!
- Katie Matheus
 - Research competing designs including the past years' projects and what were the issues to improve.
 - Meet with our advisor and client.
- Meghan Hayes
 - Research competing designs and standards
 - Meet with advisor and client
- Madeline
 - Research designs of products of similar usage to find ways to adapt them to our clients needs.
 - Meet with client, advisor, and the rest of the team to finish introductions and begin work on designs.
 - Attend the first BSAC meeting.
- Zach
 - Meet with advisor and client
 - Meet with rest of team and begin considering designs and product requirements
 - Research previous designs and how to implement suggested improvements
- Victoria Kind
 - Research similar products and identify constraints that need to be improved based on clients needs.
 - Meet with advisor and client, and the team to gather ideas and begin working on designs

Summary of Team Accomplishments

1. Meet with the client
2. Create a product design specification document

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Carmen Tanem	9/17/26	Work on PDS	4	5	5
	9/14/26	Research a competing design	0.5		
	9/14/26	Research a competing design	0.5		
Katie Matheus	9/15/26	Research a competing design	0.5	4.5	4.5
	9/16/26	Worked on PDS and researched an article	2		
	9/17/26	Finalize PDS and researched an article	2		
Meghan	9/16/26	Research standards and specifications	2	4.5	4.5
	9/16/26	Research competing ideas	1.5		
	9/17/26	Worked on PDS	1		
Victoria Kind	9/12/26	Research sterilization techniques and material	3	4.5	4.5
	9/12/26	Work on PDS, based on information gathered	1		
	9/17/26	Finish PDS, and research article on competing design	0.5		
Madeline	9/16/26	Research potential materials for design	2	4	4
	9/16/26	Worked on PDS with info from research	1		
	9/17/26	Research competing designs	1		
Zach	9/16/26	Worked on PDS	1	4	4
	9/17/26	Researched common environmental conditions	1		
	9/17/26	Researched possible useful materials	2		