

## **Knee Crutch**

**Date:** 9/11/24

**Client:** Daniel Kutschera

**Advisor:** Randy Bartels

### **Team:**

Violet Urdahl - Team Leader ([vurdahl@wisc.edu](mailto:vurdahl@wisc.edu))

Tess Fitzgerald - Communicator ([tkfitzgerald@wisc.edu](mailto:tkfitzgerald@wisc.edu))

Aubrey Younker - BPAG ([ayounker@wisc.edu](mailto:ayounker@wisc.edu))

Lauren Anderson - BSAC ([ldanderson6@wisc.edu](mailto:ldanderson6@wisc.edu))

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Evan Koelemay - BWIG ([ekoelemay@wisc.edu](mailto: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 sufficient mobility and stability when climbing stairs.

### **Brief Status Update:**

- This week was the first week of the design project. The team met with the client and learned about the client's needs for the project, and also about the overall scope of the project. Each team member conducted individual research in LabArchives on the knee crutch uses and competing designs.

### **Project Difficulties/Advice Requests:**

- Have reached out to the advisor, but was unable to confirm a meeting time for this week.

### **Current Design**

- This project is still in the research phase. There is no current prototype or design as of this week.

### **Materials and Expenses:**

- None to report, see table below:

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
<b>Category 1</b>										
									\$0.00	
									\$0.00	
								<b>TOTAL:</b>	<b>\$0.00</b>	

### Team Goals for Upcoming Week:

1. Meet with our client, Daniel Kutschera, to do introductions and ask initial project questions, ensuring we have a good understanding of his goals and intentions for this project.
2. Begin drafting Product Design Specifications
3. Continue research on knee crutches and load-bearing walking assistive devices

### Individual Goals for Upcoming Week:

- Tess Fitzgerald
  - Continue researching walking assistive devices
  - Begin working on the PDS document based on the information gathered from the client
- Aubrianna Younker
  - Research at least 2 competing designs, documenting the specific limitations of stair climbing
  - Use the information from the client meeting to write a strong problem statement for the PDS document
- Lauren Anderson
  - Use the information provided by our client to look into competing designs to generate a list of limitations for the products that are currently on the market
  - Work of the PDS document with the information shared by our client
- Violet Urdahl
  - Create possible design ideas for project
  - Communicate further with client on previous solution and identify ways to incorporate it into design/ improve upon it
  - Research physiological constraints involved in stair climbing
- Kayla Christy
  - Start researching competing designs based off of the information we learn from our client
  - Create a list of requirements that our project needs to meet and start doing research and coming up with designs for our product.

- Evan Koelemay
  - Combine ideas from the existing prototype and other designs to begin formulating a rough idea of how our product should look/function.
  - Study the videos provided by our client to best integrate the intended use of this product into the potential designs.

## Timeline

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

## Previous week's goals and accomplishments:

- Tess Fitzgerald
  - Researched knee crutches to better understand the context of the project. Additionally, researched other methods for walking assistance.
  - Set up progress report for week 1 (9/5 - 9/11)
  - Set up a shared drive for the team to collaborate and share information together.
  - Communicated with client and advisor to set up meetings.

- Aubrianna Younker
  - Looked at the reports and deliverables from the group that previously worked on this project to understand what work has been done, and how the project differs
  - Read the client's project description, brainstorming questions to fill in any gaps in our understanding
  - Explored our shared drive and lab archives, so I know where to find things and where to put things
- Lauren Anderson
  - Read the project description in depth and pulled out key details to research further
  - Read about two competing designs and took notes on what the limitations were
  - Explored our shared drive and our lab archives to understand how to record research and stay organized as a team
  - Met with our team to create a list of questions for our client
- Violet Urdahl
  - Read client's project description to identify current problem
  - Researched iWalk (current design on market)
    - Looked further into stability constraints of other knee crutches
  - Created team LabArchives notebook
  - Began brainstorming possible designs
  - Created questions for client meeting
- Evan Koelemay
  - Found competing designs on the internet and took note of the ways in which this product needs to vary from the existing designs.
  - Worked with our team to schedule days to meet outside of scheduled meetings and discussed the information we were looking to obtain from our client meeting.
  - Began the setup of the project website
- Kayla Christy
  - Started researching our project and created a labarchives page about competing designs.
  - Created a list of questions for our client about the product and what they are looking for.
  - Met with our team to meet our advisor and talk about our upcoming meeting with our client.

## Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Tess Fitzgerald	9/10/2025	Researched the uses for knee crutches and various walking assistive devices. Also set up a progress report and client meeting.	2	2	2
Aubrianna Younker	9/10/25	Brainstormed client questions and looked at the work of the previous group.	1.5	1.5	1.5
Lauren Anderson	9/10/25	Began research on competing designs and attended a team meeting to discuss questions for our client.	1.5	1.5	1.5
Kayla Christy	9/10/25	Created a list of questions for our client and added them to our group's shared document. Started looking at competing designs for our project.	2	2	2
Violet Urdahl	9/9/2025	Researched current designs and their viability	2	2	2
Evan Koelemay	9/10/2025	Looked into existing designs on the market and compared them to the project description to see what differences should be made. Discussed questions for the client meeting with the team.	1.5	1.5	1.5