

Step by Step: A Comprehensive Approach to Stair Climbing Assistance

Date: 3/7/2024

Client: Dan Kutshera

Advisor: Dr. Russ Johnson

Team:

Margo Amatuzio

Gracie Kreissler

Delani Wille

Cameron Owens

Riley Toth

Problem statement

In the field of neuro-rehabilitation, physical therapists encounter a significant obstacle when assisting patients with weight-bearing restrictions to transition back to their homes. The primary challenge revolves around negotiating steps, which often proves to be an arduous task due to various constraints. Ramps, typically considered a solution, are frequently deemed impractical due to cost implications and compliance with rise-to-run criteria. As an alternative, patients are advised to use garden benches from hardware stores, which lack adjustability and medical design. This makeshift solution is frustrating for healthcare providers, as it is not purpose-built and poses issues with bench availability.

To address this gap in the next three months, there is a clear need for a specialized, medically designed bench tailored for step use, offering safety and adjustability to improve the mobility and independence of patients in neuro-rehabilitation.

Brief status update

This week, we are finalizing the ARROW documents and going over some last minute suggestions before submission. Delani has been working on the invention disclosure with WARF and plans to submit that soon. We are planning to meet in the TeamLab on Friday to finish the prototype – attaching the adjustable support column to the base. After completion, we will test within our team and finalize our design.

Difficulties / advice requests

Current design

Materials and expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Date	Total
CORNER BRACE	BRACE, CORNER_2"_GAL V_4PK	Everbilt	030699152674	Home Depot	02/04/24	\$6.97
BRACE, CORNER_5"_ZIN C	BRACE, CORNER_5"_ZINC	Everbilt	030699152124	Home Depot	02/04/24	\$5.94
CLEVIS PIN	TOWSMART 3/8" CLEVIS PIN	TowSmart	849278012038	Home Depot	02/04/24	\$5.38
SQ TB1.25	PUNCHED SQ TUBE ZP 1-1/4X36	Everbilt	887480030471	Home Depot	02/04/24	\$22.93
SQUARE TUBE	TUBE SQUARE ALUM 48X1X1/16	Everbilt	887480013078	Home Depot	02/04/24	\$28.47
8 IN SHIMS	8" COMPOSITE SHIM (12 PC BDL)	Timberwolf	852981002098	Home Depot	02/04/24	\$2.28
						\$71.970

Major team goals for the next week

1. SUBMIT ARROW???

Next week's individual goals

- Riley Toth
 - Finish up arrow and submit it
- Delani Wille
 - Schedule meeting with WARF
- Gracie Kreissler
 - Assist with writing questionnaire
 - Finish the prototype and begin testing
- Margo Amatuzio
 - Review ARROW documents with the team for submission
 - Assist team in completing the prototyping and connecting the base to the column
- Cam Owens
 - Finish or help with any remaining work on the prototype
 - Help group members with other tasks

Timeline

Task	Jan	Feb				March					April				May	
	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10
Project R&D																
Empathize	x	x	x													
Background...																
Prototyping																
Testings																
Deliverables																
Progress Reports	x	x	x	x	x	x										
Prelim presentation			x													
Final Poster																
Meetings																
Client	x															
Advisor	x	x	x	x		x										
Website																
Update																

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Riley Toth
 - Review ARROW document to ensure correctness
 - Write an email to be sent to participants

- Write questionnaire
- Delani Wille
 - Met with Dan to get iwalk and boots for testing
 - Worked on Invention Disclosure
 - Met with Russ to Review Disclosure
- Gracie Kreissler
 - Met with machinists and discussed way to connect current base to adjustable support column
- Margo Amatuzio
 - Research questionnaire framework
 - Set up a time to finalize ARROW documents
- Cameron Owens
 - Finished working on some ideas for the base design, worked with the team to set up a time to finalize the study specifications.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Riley Toth	3/6/2024	Arrow	1	1	15
Delani Wille	3/6/2024 3/6/2024 3/7/2024	Meeting with Client, Dan Invention Disclosure Invention Disclosure meeting, Russ	1 1.5 0.5	3	18
Gracie Kreissler	3/03/2024	met with machinist	1	1	16
Margo Amatuzio	3/6/2024	Questionnaire research	1	1	12.5
Cameron Owens	3/5/2024 3/4/2024	Prototype Work Arrow	1 0.5	1.5	17.5