

Rise and Stride

April 16th - April 22nd, 2025

Client: Debbie Eggleston

Advisor: Prof. John Puccinelli

Team Members:

Madison Michels (mmichels2@wisc.edu), Communicator

Lucy Hockerman (lhockerman@wisc.edu), Team Leader

Presley Hansen (pmhansen3@wisc.edu), BSAC

Sadie Rowe (skrowe2@wisc.edu), BWIG

Kate Hiller (khiller@wisc.edu), BPAG

Problem Statement:

Ankle foot orthoses (AFOs) are designed to provide dorsiflexion support during the swing phase of walking. These devices are primarily used to treat muscular dystrophies. For this project, we are focusing on young individuals diagnosed with Facioscapulohumeral Dystrophy (FSHD), the most common type of muscular dystrophy. The team aims to design a brace for teens that assists with ankle dorsiflexion, promoting safer walking while remaining easily concealable and flexible enough to allow for functional ankle movement. The brace will be tailored specifically for the client, Maggie Eggleston. Key objectives for the device include positioning the ankle inadequate dorsiflexion, maintaining a slim, discreet design, and ensuring sufficient flexibility to minimize movement restriction.

Brief Status Update:

Sent the prototype to the patient and client along with testing instructions. Completed additional force plate stabilogram testing to assess inversion support. Completed and analyzed OpenCap testing on team members.

Team Goals:

- Help Maggie and Debbie with any testing confusion/technical issues as they are completing at home testing
- Analyze data results
- Complete and present final presentation

Individual Accomplishments:

- Lucy:
 - Attended advisor meeting
 - Met with team to redo force plate testing and run OpenCap testing
 - Analyzed OpenCap testing through MATLAB

- Worked on final presentation
- Presley:
 - Attended advisor meeting
 - Met with team for more force plate testing
 - Met with team to discuss data analysis plans
 - Attended last BSAC meeting
 - Worked on poster for poster presentation
- Maddie:
 - Attended advisor meeting
 - Wrote MATLAB code to analyze and graph stabilogram results
 - Aided client testing via Zoom
 - Met with team to discuss data analysis plans
 - Completed final poster section
- Sadie:
 - Attended advisor meeting
 - Met with team to conduct secondary round of testing
 - Met with team to discuss OpenCap Analysis
 - Wrote MATLAB code to analyze OpenCap Data and create plots
- Kate:
 - Attend advisor meeting
 - Met with team to conduct OpenCap and Force Plate Testing
 - Met with team to figure out testing analysis for OpenCap
 - Worked on final deliverables

Individual Goals:

- Lucy:
 - Analyze client's OpenCap data
 - Finish and present final poster presentation
 - Finish the final deliverables
- Presley:
 - Finish the final deliverables
 - Edit poster and prepare for the poster presentation on Friday
 - Analyze OpenCap testing results
- Maddie:
 - Analyze OpenCap testing results
 - Analyze force plate testing results
 - Perform statistical analysis on all testing data
 - Finish the final deliverables
 - Give presentation on Friday
- Sadie:

- Analyze OpenCap testing from client
- Edit final deliverables and prepare for presentation
- Print poster
- Present on Friday
- Discuss design changed w/ team
- Kate:
 - Finish poster
 - Print final poster
 - Attend poster presentations
 - Discuss future work/expectations

Design Accomplishments:

Sent the prototype to the patient and clients

Weekly/Ongoing Difficulties:

OpenCap difficulty finding consistent data during recorded gait. Force plate testing does not show statistically significant results.

Project Timeline:

Week	Description	Status
1/24 - 1/31 Week 1	Weekly Team Meeting 1	Complete
	Advisor Meeting 1	Complete
1/31 - 2/6 Week 2	Weekly Team Meeting 2	Complete
	Progress Report 1	Complete
	Have 1st Client Meeting	Complete
	Product Design Specification (PDS) Draft	Complete
	Advisor Meeting 2	Scheduled for 2/5
2/7 - 2/14 Week 3	Weekly Team Meeting 3	Scheduled for 2/14
	Progress Report 2	Due 2/11
	Tong Lecture	Scheduled 2/7

	Advisor Meeting 3	Scheduled 2/12
	Design Matrix	Due 2/13
2/14 - 2/21 Week 4	Weekly Team Meeting 4	Scheduled 2/21
	Preliminary Deliverables Due (2/21)	Due 2/21
	Progress Report 3	Due 2/18
	Advisor Meeting 4	Scheduled 2/19
	Preliminary Presentations	Scheduled 2/21
	Preliminary Presentation Draft	Due 2/19
	Design Consultation Meeting	Scheduled 2/19
2/21 - 2/28 Week 5	Weekly Team Meeting 5	Scheduled 2/20
	Progress Report 4	Due 2/25
	Preliminary Report Due (2/26)	Due 2/26
2/28 - 3/7 Week 6	Weekly Team Meeting 6	Scheduled 2/28
	Progress Report 5	Due 3/4
	Individual Advisor Meetings	Scheduled 4/5
3/7 - 3/14 Week 7	Weekly Team Meeting 7	Scheduled 3/7
	Progress Report 6	Due 3/11
	Advisor Meeting 7	Scheduled 3/12
3/14 - 3/21 Week 8	Weekly Team Meeting 8	Scheduled 3/14
	Progress Report 7	Due 3/18
	Show and Tell	Scheduled 3/21
	Advisor Meeting 8	Scheduled 3/19
Spring Break (3/21 - 3/28)		
	Weekly Team Meeting 9	Scheduled 4/4

3/31 - 4/4 Week 9	Advisor Meeting 9	Scheduled 4/2
	Progress Report 8	Due 4/1
4/4 - 4/11 Week 10	Weekly Team Meeting 10	Scheduled 4/11
	Progress Report 9	Due 4/8
	Advisor Meeting 9	Scheduled 4/9
4/11 - 4/18 Week 11	Weekly Team Meeting 11	Scheduled 4/18
	Meeting with Thomas Ziemer	Scheduled 4/14
	Progress Report 10	Due 4/15
	Advisor Meeting 10	Scheduled 4/16
4/18 - 4/25 Week 12	Final Poster Presentation	Scheduled 4/25
	Progress Report 11	Due 4/22
	Advisor Meeting 11	Scheduled 4/23
4/25 - 5/30 Week 13	Weekly Team Meeting 13	Scheduled 4/28
	Progress Report 12	Due 4/28
	Final Deliverables Due	Due 4/30

Expenses - Spring 2025

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total		Total Budget Spent	Link
Category 1 - Rigid Support												
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		MakerSpace		2/28/2025	1	\$0.86	\$0.86			
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		MakerSpace		3/5/2025	1	\$2.42	\$2.42			
CF-PLA	Carbon Fiber	Shen		Maker		3/14	1	\$3.6	\$3.6			

	PLA 3D Print	Printer		rSpace		/2025		6	6			
CF-PLA (red)	Carbon Fiber PLA 3D Print	Shen Printer		Make rSpace		4/4/2025	1	\$3.92	\$3.92			
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		Make rSpace		4/4/2025	1	\$1.94	\$1.94			
Category 2 - Straps and Padding												
Carpet Tape		Capitol	705-1560	Menards	7051560	4/2/2025	1	\$7.36	\$7.36		\$7.36	link
Mesh Padding	3D Air Sponge Mesh Fabric	Tong Gu		Amazon		3/7/2025	1	\$16.99	\$16.99		\$16.99	link

Expenses - Fall 2024

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Ankle Brace - Component 1										
Ankle Brace	Cloth brace	Abiram		Amazon		10/10/2024	1	\$14.88	\$14.88	Link
Gel padding	medical grade padding	Shechekin		Amazon		10/10/2024	1	\$15.81	\$15.81	Link
Gel sock	Compressive sock to support the carbon fiber	KEMFORD		Amazon		10/10/2024	1	\$15.95	\$15.95	Link
Plastic cord locks	End of the bungee	Head US		Amazon		10/10/2024	1	\$3.98	\$4.20	Link
Nylon Fabric	fabric/cloth to sew carbon fiber	MYUREN		Amazon		11/6/2024	1	\$12.61	\$12.61	Link
Bungee pt 2	stronger bungee to support better dorsiflexion	LuckyStraps		Amazon		10/23/2024	1	\$18.99	\$20.03	Link
Bungee	thinner bungee	Huouoo		Amazon		10/25/2024	1	\$6.32	\$6.32	Link
Mini caribener	small sized caribener to hold bungee	REI		REI		11/4/2024	1	\$6.00	\$6.00	In-store
Shock	thinner and stronger	REI		REI		11/4/2024	1	\$5.9	\$6.61	In-store

cord	bungee					024		5			
Lock laces	lock laces to fix the slipping problem of the plastic cord lock	Lock Laces		Amazon		11/4/2024	1	\$12.65	\$12.65	Link	
Fabric Glue	glue to attach the cord locks to the fabric	E6000		Amazon		11/08/2024	1	\$8.14	\$8.14	Link	
Needles and Thread	Stronger needles and thread to attach various fabrics	Basic Home		Amazon		12/03/2024	1	\$8.43	\$8.43	Link	
Carbon Fiber piece - Component 2											
3D printing prototype	3D printing of back support	Bambu printer		Makerspace		11/8/2024	1	1.4	\$1.40	*covered by our given \$50 per team	
3D printing prototype - 3 variants	3D printing of back support	Bambu printer		Makerspace		11/12/2024	1	3.8	\$3.80	*covered by our given \$50 per team	
3D printing prototype	3D printing of back support	Bambu printer		Makerspace		11/13/2024	1	1.71	\$1.71	*covered by our given \$50 per team	
Lock lace piece	3D printing the lock lace piece	Bambu printer		Makerspace		11/18/2024	1	0.23	\$0.23	*covered by our given \$50 per team	\$8.71
3D Printing Final Prototype	3D printing of back support	Shen Printer		Makerspace		12/3/2024	1	1.57	\$1.57	*covered by our given \$50 per team	
Epoxy Mold - Component 3											
Epoxy	Take cast of the leg	Easy Pour Epoxy		Amazon		11/14/2024	1	\$39.97	\$39.97	Link	
Mold	PVA release agent -	Mrealeaz		Amazon		11/14/	1	0	\$0.00	*Used	

release Agent	Prevent bonding to the cast	y				2024				the provided materials in ECB	
								TOTAL:	\$189.02		

EXPENSES - Spring 2025

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total		Total Budget Spent	Link
Category 1 - Rigid Support												
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		Make rSpace		2/28/2025	1	\$0.86	\$0.86			
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		Make rSpace		3/5/2025	1	\$2.42	\$2.42			
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		Make rSpace		3/14/2025	1	\$3.66	\$3.66			
Category 2 - Straps and Padding												
Carpet Tape		Capitol	705-1560	Menards	7051560	4/2/2025	1	\$7.36	\$7.36		\$7.36	link
Mesh Padding	3D Air Sponge Mesh Fabric	Tong Gu		Amazon		3/7/2025	1	\$16.99	\$16.99		\$16.99	link
Velcro	Velcro pieces			Make rSpace		2/28/2025	1	\$0.40	\$0.40			
								TOTAL:	\$31.69	Budget Spent:	24.35	

