

Rise and Stride

February 1st - February 10th, 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:

Our group completed the PDS and initiated design conception. We have created 3 new designs and 3 new material considerations for our rigid support.

Team Goals:

- Brainstorm 3 new designs
- Research material properties
- Complete design matrix
- Have our second advisor meeting

Individual Accomplishments:

- Lucy:
 - Met with the team twice to discuss designs and complete the design matrix
 - Worked on design matrix criteria explanations
 - Updated the PDS on new research relating to competing designs
 - Attended advisor meeting

- Presley:
 - Met with the team twice to discuss designs and start creating the design matrix
 - Worked on the design matrix explanations
 - Shared individual research with the team during the weekly advisor meeting
- Maddie:
 - Drew a design in the design matrix
 - Conducted materials research on fiberglass tape, PE, and PP
 - Met with the team to rank design matrix components
 - Conducted research on competing designs and design considerations
 - Attended advisor meeting
- Sadie:
 - Sketched design for design matrix
 - Met with team twice to brainstorm design ideas and rank design matrix components
 - Updated lab archives with new design ideas/sketches
 - Continued research on competing designs
- Kate:
 - Sketched calf hug design for the design matrix
 - Met with advisor
 - Met with team to discuss design matrix
 - Researched competing designs

Individual Goals:

- Lucy:
 - Continue researching
 - Prepare materials and fabrication protocol for new rigid design
 - Begin discussion with team about preliminary presentations
- Presley:
 - Continue researching AFO designs, impacts, and materials
 - Attend next BSAC meeting
 - Prepare materials for preliminary presentations
 - Attend next advisor meeting
- Maddie:
 - Research fabrication and testing methods for the brace
 - Prepare materials for preliminary presentations
 - Attend advisor meeting
- Sadie:
 - Research fiberglass fabrication methods for chosen design
 - Attend advisor meeting
 - Prepare for preliminary presentations

- Kate:
 - Prepare for the preliminary presentation
 - Attend advisor meeting
 - Brainstorm securement methods for the brace

Design Accomplishments:

The team is organizing a meeting with the client to discuss project requirements.

Weekly/Ongoing Difficulties:

No difficulties have been identified at this early stage of the project.

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 2/17
2/21 - 2/28 Week 5	Weekly Team Meeting 5	
	Progress Report 4	
	Advisor Meeting 5	
2/28 - 3/7 Week 6	Weekly Team Meeting 6	
	Progress Report 5	
	Advisor Meeting 6	
3/7 - 3/14 Week 7	Weekly Team Meeting 7	
	Progress Report 6	
	Advisor Meeting 7	
	Tong Lecture	Scheduled 3/7
3/14 - 3/21 Week 8	Weekly Team Meeting 8	
	Progress Report 7	
	Show and Tell	Scheduled 3/21
	Advisor Meeting 8	
Spring Break (3/21 - 3/28)		
3/31 - 4/4 Week 9	Weekly Team Meeting 9	
	Advisor Meeting 9	
	Progress Report 8	
4/4 - 4/11 Week 10	Weekly Team Meeting 10	
	Progress Report 9	
	Advisor Meeting 9	
4/11 - 4/18 Week 11	Weekly Team Meeting 11	
	Progress Report 10	

	Advisor Meeting 10	
4/18 - 4/25 Week 12	Final Poster Presentations (4/25)	
	Progress Report 11	
	Advisor Meeting 11	
4/25 - 5/30 Week 13	Weekly Team Meeting 13	
	Progress Report 12	

Expenses

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	Headous		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 cord	thinner and stronger bungee	REI		REI		11/4/2024	1	\$5.95	\$6.61	In-store

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	\$1.40	\$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	\$3.80	\$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 release	PVA release agent - Prevent bonding to	Mrealeazy	Amazon	11/14/2024	1	\$0.00	\$0.00	*Used the	

Agent	the cast										provide d material s in ECB
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