Rise and Stride

February 5th - March 11th, 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:

The team has fully constructed a functional prototype that incorporates the outside and inside of Maggie's foot. We are beginning to evaluate testing protocols and performance goals.

Team Goals:

- Complete the straps and foam assembly
- Order foam
- Complete our prototype and try in conjunction with the bungee brace

Individual Accomplishments:

- Lucy:
    - Attended individual conference meeting
    - Emailed Dr. Adamczyk about future testing plans
    - Researched testing options at UW-Madison
    - Research general gait analysis options
- Presley:

    - Attended individual conference meeting
    - Met with the team to discuss padding for brace
    - Researched materials for padding the brace
- Maddie:
    - Designed and printed the outside molds of the foot
    - Assembled new straps and padding for the new brace iteration
    - Researched and ordered foam for the padding on the brace
    - Attended my individual conference meeting
    - Tried the brace on and attempted dorsiflexion/plantarflexion and inversion/eversion
- Sadie:
    - Researched and ordered padding for brace interior
    - Met with team to discuss design progress
    - Researched foam attachment methods
    - Attended individual conference meeting
- Kate:
    - Attended individual conference meeting
    - Met with the team and brought own brace to discuss the bungee aspect
    - Ordered materials for the padding
    - Helped assemble new straps and foam ideas for comfort

Individual Goals:

- Lucy:
    - Awaiting response, but hopefully meet with Dr. Adamczyk
    - Attend next advisor meeting
    - Write and plan concrete testing protocols
- Presley:
    - Attend next advisor meeting
    - Attend next BSAC meeting
    - Write fabrication protocol
    - Attach foam to rigid support
- Maddie:
    - Develop testing protocols and expected results
    - Create a fabrication protocol
    - Attend advisor meeting
- Sadie:
    - Write fabrication protocol
    - Determine foam attachment method
    - Write testing protocols in preparation for client testing
    - Attend advisor meeting

- Kate:
    - Write testing protocol
    - Attend advisor meeting
    - Create the bungee mechanism for our device with the compression sleeve

Design Accomplishments:
The team 3D-printed the inversion support with CF-PLA and plan to complete the initial prototype early this week. The team will discuss necessary changes to the design and reprint or fabricate as needed.

Weekly/Ongoing Difficulties:
Uncertainty in motion capture system for weekend testing.

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)		
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 - Spring 2025

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total		Total Budget Spent	Link
Category 1 - Rigid Support												
Velcro	Velcro pieces	Shen Printer		MakerSpace		2/28/2025	1	$0.40	$0.40			
Category 2 - Straps												
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		MakerSpace		2/28/2025	1	$0.82	$0.82			
									$0.00			
								TOTAL:	**$1.22**	**Budget Spent:**	0	

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	**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 attatch 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	3D printing of back	**Bambu**		Makersp		11/12/	1	3.8	$3.80	***covere**

printing prototype - 3 variants	support	**printer**		ace		2024				**d by our given $50 per team**	
3D printing prototype	3D printing of back support	**Bambu printer**		Makersp ace		11/13/ 2024	1	1.71	$1.71	***covere d by our given $50 per team**	
Lock lace piece	3D printing the lock lace piece	**Bambu printer**		Makersp ace		11/18/ 2024	1	0.23	$0.23	***covere d by our given $50 per team**	**$8. 71**
3D Printing Final Prototype	3D printing of back support	**Shen Printer**		Makersp ace		12/3/2 024	1	1.57	$1.57	***covere d 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 Agent	PVA release agent - Prevent bonding to the cast	**Mrealeaz y**		Amazon		11/14/ 2024	1	0	$0.00	***Used the provide d material s in ECB**	
								TOT AL:	**$189.0 2**		

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Category 1 - Rigid Support												

CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		MakerSpace		2/28/2025	1	$0.82	$0.82			
CF-PLA	Carbon Fiber PLA 3D Print	Shen Printer		MakerSpace		3/5/2025	1	$2.42	$2.42			
Category 2 - Straps												
Velcro	Velcro pieces	Shen Printer		MakerSpace		2/28/2025	1	$0.40	$0.40			
								TOTAL:	**$3.64**	**Budget Spent:**	0	