

Inconspicuous Ankle Foot Orthosis (AFO) for teen

October 03rd - October 9th, 2025

Client: Debbie Eggleston

Advisor: Dr. Justin Williams

Team Members:

Alex Conover (Team Leader)

Avery Lyons (Communicator)

Claire Matthai (BSAC)

Aditi Singhdeo (Co-BPAG)

Celia Oslakovic (Co-BPAG)

Sean Carey (BWIG)

Problem Statement:

Ankle-foot orthoses (AFOs) are designed to support dorsiflexion during the swing phase of walking. They are commonly used in managing muscular dystrophies, and for this project, our focus is specifically on adolescents with Facioscapulohumeral Dystrophy (FSHD), the most prevalent form of muscular dystrophy. Our goal is to create a brace that helps teens achieve safer walking by assisting ankle dorsiflexion, while remaining discreet, lightweight, and flexible enough to allow natural ankle motion. The main design priorities are to position the ankle in proper dorsiflexion, keep the brace slim and unobtrusive, and provide enough flexibility to reduce movement restrictions.

Status Update:

The team worked to complete the preliminary report, attached to the team email. All information regarding the current state of the problem can be found in the report. The team also worked to present the preliminary presentation last week Friday, 10/03. The team performed amicably, and will start work on prototyping next week.

Summary of Weekly Team Member Design Accomplishments (Include time spent):

Alex:

- Completed the preliminary report (3 hours)
- Presented the preliminary presentation 10/3 (15 min)
- Attended 300 lecture (1 hour)

Avery:

- Completed Design Matrix, Designs, and Past Fabrication sections of Preliminary Report (1.5 hours)

- Looked over and edited report (30 mins)
- Emailed with client about Madison travel plans (30 mins)
- Completed preliminary presentation (15 mins)
- Attended BME 300 lecture (1 hour)

Claire:

- Completed Fabrication and Development Process section of preliminary report (2 hours)
- Presented preliminary presentation (15 mins)

Aditi:

- Completed preliminary presentation (15 mins)
- Completed Testing section of preliminary report (1.5 hours)
- Researched how to carry out FEA and force plate testing for (30 mins)

Celia:

- Completed Beginning sections of Preliminary Report (1.5 hours)
- Completed Biosafety training (1 hour)
- Completed Chemical safety training (1 hour)

Sean:

- Preliminary Presentation (15 min)
- Discussion and Conclusion part of preliminary report (2 hours)

Weekly/Ongoing Difficulties

The team is working on setting up a meeting time to bring our client down for testing. We need to work out whether or not we are meeting next weekend (10/18), or attempting to meet in November, (11/8).

Upcoming Team and Individual Goals

Team:

- Order materials for testing (polyester and 3D print the TPU)
- Consult the makerspace to re-design the inversion prevention methods.

Individual:

Alex:

- Meet with the makerspace either this week or next week depending on timing.
- Ensure materials get ordered for testing and fabrication
- Nail down a date for testing
 - If testing is this coming week, we will use old prototypes and educate everyone on how the testing procedures work, as well as the equipment we will be using.

Avery:

- Continue to discuss Madison travel plans with client
- Research testing methods
- Email progress report and preliminary report to Professor Williams and the client

Claire:

- Complete biosafety training and online portion of design innovation lab training
- Gain an understanding of the testing protocols we plan to use

Aditi:

- Complete biosafety and design innovation lab training
- Research what testing can be done to help decide on elastic strap material

Celia:

- Complete design innovation lab training
- Figure out fabrication method
- Further understand testing process

Sean:

- Research fabrication and testing methods in preparation for future work
- Research how to use/fabricate the materials we will be using

Project Timeline

Project Goal	Deadline	Team Member Assigned	Progress	Completed
Meet with Client	9/10/2025		100%	
→ email client with dates	9/14/25	Avery	100%	
→ create question list		All	100%	
→ write summary and put in notebook		All	100%	
PDS Draft	9/18/2025		100%	
→ submit draft		Alex		
Design Ideas and Matrix	9/26/2023		100%	
→ create design 1		All		
→ create design 2		All		
→ create design 3		All		
→ compare designs in matrix		All		
Preliminary Design Presentation	10/03/2023		100%	
→ upload to website		Sean		
Preliminary Deliverables	10/08/2023		80%	
→ email report and notebook		Avery		
→ upload report to website		Sean		
→ peer/self evaluations		All		

