

Inconspicuous Ankle Foot Orthosis (AFO) for teen

October 17th - October 23rd, 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 is working on creating the first prototype of the AFO, including printing various pieces of the brace, ordering new parts, and working on the method of fabrication to bring it all together. Hopefully, the team can bring all the pieces together to have a complete prototype to receive feedback during show and tell 10/31.

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

Alex:

- Printed the new TPU test strip (30 minutes)
- BME 300 Lecture 10/22 (50 minutes) - post grad ideas!
- Team meeting 10/19 to delegate the tasks of the week (30 min)
- Work on the Onshape model for the lateral side (20 min)
- Emailed Dr. P for access to the testing lab and parking pass for our Client (10 minutes)

Avery:

- Made new test strip in SolidWorks 1inchx12inchx1/32inch (30 mins)
- Researched MTS testing and protocols (45 mins)
- Attended BME 300 lecture on 10/22 (50 mins)
- Attended and notated weekly team meeting on 10/19 (30 mins)
- Emailed client about parking pass (10 mins)

Claire:

- Completed Intro to Machining Online Training (3 hours)
- Researched materials for inside of inversion supports (45 mins)

Aditi:

- Researched and brainstormed design ideas for repeated testing device (2 hours)
- Worked on the final design for the testing device (1.5 hours)
- Completed hands on training for intro to shop tools (30 mins)

Celia:

- Worked on lateral side of brace in CAD (1 hour)
- Completed Intro to Machining Online Training (2.5 hours)

Sean:

- Developed a model for testing a device in CAD (2 hours)
- Created a model for the lateral side of the brace (2.5 hours)

Weekly/Ongoing Difficulties

Debbie - Our parking situation has been figured out.

Upcoming Team and Individual Goals

Team:

- Finish initial prototype for show and tell next week!
- Get MTS testing completed for strength of TPU filament and elastic bands.
- Get baseline data for a healthy individual in the force plate testing.

Individual:

Alex:

- Finish onshape model for the lateral side
 - Print medial and lateral side
- Fully assemble the prototype to provide for show and tell 10/31
- Update or upload the data for “normal” force plate testing
- Receive an update from Dr. P on our meeting dates to ask for parking pass and access to the BME lab

Avery:

- Help assemble prototype for show and tell
- Email Dr. P the mailing address for client parking passes
- Make more test strips in SolidWorks if necessary

Claire:

- Complete in-person training for Intro to Machining
- Start fabricating the inside padding for inversion supports

Aditi:

- Complete online and in-person training for Intro to Machining
- Work on the arduino code for testing apparatus

Celia:

- Complete in-person Intro to Machining training
- Print CAD models
- Continue to update cost spreadsheets

Sean:

- Build the testing device
- Keep working on the brace model if changes are needed

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		100%	
→ email report and notebook		Avery		
→ upload report to website		Sean		
→ peer/self evaluations		All		

