Inconspicuous Ankle Foot Orthosis (AFO) for teen - BME 301

January 20th, 2026 - January 29th, 2026

Client: Debbie Eggleston

Advisor: Dr. Monica Ohnsorg

Team Members:
Alex Conover (Team Leader)
Avery Lyons (Communicator)
Sierra Loosen (BSAC)
Kalob Kimmel (BPAG, 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 met over zoom after project selection to decide roles and find a good weekly meeting time. Avery and Alex are continuing their roles from the previous semester, Sierra decided on BSAC, and Kalob decided to take both BPAG and BWIG. The team allotted time on Mondays, at 1 PM CST, for the weekly recurring meeting. Initial research is being performed to catch all new members up to speed, as well as reviewing old documents from last semester. Per the BME 301 course, new research was done for the returning members. The team was caught up on prototypes and plans to meet with Mrs. Eggleston next week to receive an update on how the current prototype is performing.

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

<u>Alex:</u>

- Researched FSHD, AFO competing designs, material choices, fabrication methods, physiology, and some biology (3 hours)
- Uploaded prior documentation from previous semesters to lab archives (30 minutes)

- Attended team meeting on 1/26 (1 hour)

Avery:

- Researched FSHD and AFO studies previously done (2 hours)
- Communicated with client to set up client meeting for 02/03 via Zoom (30 mins)
- Attended team meeting on 1/26 (1 hour)

Sierra:

- Read through the final reports from the previous three semesters (1 hour)
- Researched what FSHD and AFOs are (2 hours)
- Attended team meeting on 1/26 (1 hour)

Kalob:

- Researched AFO and looked through past semesters (2.5 hrs)
- Attended team meeting on 1/26 (1 hr)

Weekly/Ongoing Difficulties

The team needs to figure out the best way to tackle the testing portion of this project, as Mrs. Eggleston is located in Michigan. We will reach out to professors and/or friends of Avery's to see if we can set up a meeting, or just to introduce ourselves so we can continue to work without bringing the client to Wisconsin.

Upcoming Team and Individual Goals

Team:

- Meet with Mrs. Eggleston Tuesday next week (02/03) 8 am CST.
- Discuss upcoming design changes
- Meet with our advisor, Dr. Ohnsorg, and get her up to speed on this project, and ask for tips on how to work with this distance in mind.

Individual:

Alex:

- Continue to perform research in lab archives, and complete assignments for BME 301 lecture as they come up
- Attend advisor meeting 1/30, 1:35 pm
- Update and finalize the PDS with new information regarding the current prototype

Avery:

- Continue to research FSHD and AFO studies
- Begin Product Design Specifications (PDS)
- Attend advisor meeting on 1/30

Sierra:

- Continue researching AFOs to improve our design

- Work on assigned section of PDS
- Attend weekly advisor meeting on 1/30

Kalob:

- Continue Research into AFOs and start looking into materials
- Work on PDS
- Attend Meetings

Project Timeline

Project Goal	Deadline	Team Member Assigned	Progress	Completed
Meet with Client	02/05/2026		33%	
→ email client with dates	01/27/2025	Avery	100%	
→ receive update from client	02/03/2026	All	00%	
→ write summary and put in notebook	02/03/2026	All	00%	
PDS Draft	02/05/2026		00%	
→ submit draft		Kalob		
Design Ideas and Matrix	02/12/2026		00%	
→ create design 1		All		
→ create design 2		All		
→ create design 3		All		
→ compare designs in matrix		All		
Preliminary Design Presentation	02/20/2026		00%	
→ upload to website		Kalob		
Preliminary Deliverables	02/27/2026		00%	
→ email report and notebook		Avery		
→ upload report to website		Kalob		
→ peer/self evaluations		All		
Decide on Final Design	03/06/2026		00%	
→ get feedback from client on design		All		
Show and Tell	03/20/2026		00%	
→ create an initial prototype		All		
Final Poster Presentation	04/27/2026		0%	
→ invite client		Avery		

→ post on website		Kalob		
Final Deliverables	04/29/2026		0%	
→ submit final notebook and report		Avery and Kalob		
→ submit peer/self and client evaluations		All		

Expenses (Fall 2025)

Item	Description	Manufacturer	Vendor	Date	QTY	Cost Each	Total
Category 1 - Rigid Support							
CF-PLA	3D printing for testing	Bambu Lab Printer	Design Innovation Lab	10/27/2025	2	$2.25	$4.50
CF-PLA	3D printed for testing of mediolateral support	Bambu Lab Printer	Design Innovation Lab	10/27/2025	2	$2.25	$4.50
CF-PLA	3D printing for final product	Bambu Lab Printer	Design Innovation Lab	11/17/2025	1	$1.90	$1.90
CF-PLA	3D printing for final product	Bambu Lab Printer	Design Innovation Lab	11/17/2025	1	$2.18	$2.18
CF-PLA	3D printing for final product	Bambu Lab Printer	Design Innovation Lab	11/19/2025	1	$2.17	$2.17
CF-PLA	3D printing for final product	Bambu Lab Printer	Design Innovation Lab	11/19/2025	1	$2.50	$2.50
Elastic Strap link	1 inch wide Polyester and Rubber blend. 10 yd in length	Cisone	Amazon	10/10/2025	1	$7.99	$7.99
TPU	TPU Test Strip for testing apparatus	Makerspace	Makerspace	10/22/2025	1	$0.39	$0.39
Padding link	Air Sponge Mesh Fabric	Tong Gu	Amazon	10/24/2025	1	$16.99	$16.99
Superglue	Superglue for fabrication	Makerspace	Makerspace	11/4/2025	1	$1.15	$1.15
Superglue	Superglue for fabrication	Makerspace	Makerspace	11/5/2025	1	$1.15	$1.15
						Total:	**$45.42**