

Title: UW Adapted Fitness: Grip strength improvement mechanism

Date: 11/13/2025

Client: Dr. Kecia Doyle

Advisor: Dr. Randy Bartels

Team: Cookie Monsters

David Diancin - Team Leader

Sydney Smith - Communicator

Gabriel Klenner - BSAC

Lucy Mcardle - BWIG

Lauren Hain - BPAG

Problem statement

Individuals in the UW Adapted Fitness program may face challenges with grip strength that limit their ability to perform daily tasks and participate in exercise. A longtime client with reduced grip strength in one hand has worked consistently to improve function but still struggles with both everyday items and workout equipment. Current tools in the Conway Adapted Fitness space are not tailored to his needs, creating a gap in training effectiveness. This project aims to design a safe, affordable, and user-friendly mechanism to support targeted grip training, improve independence, and enhance the client's overall fitness experience.

Brief status update

This week, we 3D printed additional ring sizes to expand our testing options. Lauren and Lucy fabricated bungee cords as a potential replacement for the rubber bands to provide increased tension. David and Gabe used a force gauge to measure the tension of the rubber bands, while Sydney modified the hoop by fabricating a new hole to improve the stability of the S-hook and enhance the overall appearance of the rings. On Friday, we plan to meet with the client to evaluate how the rings fit with both the rubber bands and the new bungee cord attachments.

Major team goals for the next week

1. Finalize prototype
2. Continue testing with client
3. Continue to fabricate final design pieces

Next week's individual goals

- Sydney Smith: Continue to fabricate final design and work out any flaws with client
- David Diancin: Continue testing tension for each elastic connection option and prepare equations to measure elasticity
- Lucy McArdle: Continue to fabricate using the dremel and wire cutters, and begin testing bungees to see if they are viable
- Lauren Hain: Continue to fabricate with the bungee cords and begin strength testing of the cords on the client.
- Gabe Klenner: Continue testing and create a complete data table for rubber band, bungee cord and braided fishing line strengths.

Previous week's individual goals and accomplishments

- Sydney Smith: Continue to look into bungee cords or different types of methods for hooking bands and hooks together for proper hand movement
 - Bought different lengths of bungee cords and fabricated hole portion of 3D rings
- David Diancin: Continue to find the correct ring print for each finger for the client
 - Finished large print of rings for upper part of finger
- Lucy McArdle: Find fishing line and bungee cords for alternate bands
 - Fabricated the bungee cords and purchased new connectors from Wendt for 2nd prototype
- Lauren Hain: Find other materials and upload them onto the spread sheet as BPAG to get materials ordered through the BME department
 - Got the fishing line ordered through the BME department and started fabricating with bungi cord.
- Gabe Klenner: Look for extra storage and ask at BSAC, contact Human Exercise Research Core Facility to find out how we can reserve their dynamometer
 - Started testing with rubber band and bungee cord elasticity using a digital hanging scale.

Timeline

Task	Sep				Oct					Nov				Dec	
	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12
Project R&D															
Empathize	x	x													
Background...	x	x	x	x											
Prototyping						x	x	x	x	X					
Testings								x		X	x				
Deliverables															
Progress Reports	x	x	x	x	x	x	x	x	x	X	x				
Prelim presentation				x	x										
Final Poster															
Meetings															
Client			x			x		x		X	x				
Advisor				x	x										
Website															
Update	x	x	x	x	x	x	x	x	x	X	x				

Filled boxes = projected timeline

X = task was worked on or completed