Title: UW Adapted Fitness: Grip strength improvement mechanism

Date: 09/18/2025

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

Our group has held meetings as a group and individually with Simon Nam, who previously worked on this project, and Dr Puccinelli to get a better understanding of our end goal. We reached out and have scheduled a meeting with Dr. Kecia Doyle this Friday to get us familiarized with the adapted fitness gym and the clients that our project will be for. We also have a scheduled meeting with our advisor next week Wednesday.

Major team goals for the next week

1. Continue research and compile background research with different mechanisms for grip strength training equipment
2. Meet with Dr. Doyle and take notes on client needs and environment.
3. Create a design matrix with criteria.
4. Work through and take relevant notes about the resources given from senior BME student Simon Nam.
5. Create initial design ideas to be used with the design matrix.

Next week's individual goals

- Sydney Smith: Examine/research adapted fitness devices used in rehabilitation clinics (use Simon's sources)
- David Diancin: Research current adaptive devices for grip strength and create basic sketches of initial ideas.
- Lucy McArdle: Continue to research the effects of a stroke on grip strength and grip strength devices, and begin to brainstorm ideas for our own device
- Lauren Hain: Continue to spend time researching the muscles in the hand that are used to grip and object and to research materials after meeting with our client.
- Gabe Klenner: Research possible materials and sensors to determine effectiveness, price, comfortability and shelf life for a grip strength detector.

Previous week's individual goals and accomplishments

- Sydney Smith: Review biomechanics literature on hand and grip function to inform design considerations
    - Reviewed peer-reviewed journals and documented in notebook
- David Diancin: Research adaptive grip strength mechanisms for design considerations
    - completed one research entry in notebook
- Lucy McArdle: Research effective grip strength devices and better understand client needs for project design
    - Completed one research entry in notebook
- Lauren Hain: Research background information on grip strength and grip strengthening devices and begin brainstorming design ideas
- Gabe Klenner: Research safety and usability standards for assistive fitness devices to guide early design ideas
    - Completed one research entry in notebook