Abstract
Many climbers may develop a condition known as “Climber’s Elbow,” in which the tendon between the forearm flexors and the medial epicondyle of the elbow develops microtears. A device has been created to aid in prevention of, and rehabilitation from, this condition. The device includes adjustable resistances that allows the user to change the resistance in order to match their strength level. Worn on the elbow, the forearm trainer is a portable device that can be used to strengthen the flexors and extensors of the forearm, which also take part in pronation and supination of the wrist.

Design Criteria
- Effectively targets forearm muscles
- Variable resistances
- Safe to use without risk of injury
- Portable and able to be used without a table
- Adaptable to different sized forearms
- Durable to withstand daily use for many years
- Comfortable to use
- Easy to use and assemble
- Minimal cost of production

Materials
- Upholstery Visco Memory Foam, 3.5 lb High Density
- 18x2” and 18x1” cinch straps with eyelet
- PLA
- Knurled Threaded Brass Inserts
- AZURELIFE Resistance Bands
- M4x8mm Screws

Cost to Reproduce: $80.00

Testing

Materials
- GripSaver Plus [7]
- TeachMe Series (2019) [6]
- E. Davis, PhD, private communication, Sept. 2019.

Future Work
- Continue testing device
  - Use EMG testing to better understand bicep activation within different exercises
  - Evaluate whether the device activates muscles more effectively than existing products
  - Research and incorporate better materials to be used in design
  - Tube resistance bands
  - More comfortable straps and L-piece
  - Variable handle sizes and shapes

References/Acknowledgements
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Instructions for Use:
1. Select the desired resistance band and place over upward facing hooks on back.
2. Pull the band in between the top hooks and place loop around desired downward-facing hook.
3. Place arm in device and fix velcro straps across the forearm and bicep, threading through velcro loops.
4. Perform desired exercises while holding onto handle.
5. If necessary, pull the band on the back down around an additional hook to increase resistance.

Suggested Exercises:
1. Hold onto the handle with the palm facing downward
   a. Bend wrist down (flexion) and back up
   b. Twist hand so palm faces upwards (supination) and return to starting position
2. Grip handle with palm facing upward
   a. Bend wrist so the back of the hand moves toward the ground (extension) and back up
   b. Rotate the hand so the palm is facing downward (pronation) and return to starting position