**Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis**
Progress Report 6: 3/5/2026

**Client:** Dr. Jasmine Craig
**Advisor:** Prof. Darilis Suarez-Gonzalez
**Team:**

- Leader: Jackie Behring
- Communicator: Arshiya (Ria) Chugh
- BWIG: Sofia Decicco
- BPAG: Allison (Ally) Rausch
- BSAC: Daniel Pies

**Problem Statement:** Microsurgical arterial anastomosis is a cornerstone of reconstructive surgery, enabling tissue transfer and limb salvage. Current techniques are highly time consuming, technically demanding, and are highly dependent on surgeon expertise. Suturing vessels as small as 1 mm can take even the most experienced surgeons 30-60 minutes, extending operating times and jeopardizing tissue viability. Existing stent-based approaches introduce complications by contracting the vessel lumen and lack adaptability across the wide range of vessel diameters encountered in clinical practice. There is a critical need for a biocompatible, adjustable, and easy-to-use device that can reliably reduce operative time while maintaining vessel integrity and minimizing complications.

**Brief Team Status Update:** This week the team met to review and draft testing procedures and outline the overall testing strategy. A prototype spring was trimmed to different lengths with Jesse to evaluate potential configurations. The team also spoke with Eric about additional vendors, submitted a quote request to Kellogg's Research Labs for double helical springs, and researched double and triple helical spring designs for potential future testing.

**Summary of Weekly Individual Design Accomplishments:**

- Allison (Ally) Rausch:
    - Met with team discussing next steps
    - Researched pitch / spring stents
    - Researched additional concerns surrounding testing arteries
    - Review testing plans with team
- Jackie Behring:
    - Met with team to discuss and draft testing procedures
    - Met with Jesse and Ria to cut the spring to different desired lengths
    - Had a phone call with Eric to discuss possible other vendors to reach out to
    - Researched double and triple helical springs for possible future purchasing/testing
- Sofia Decicco:
    - Review testing plans with team for nitinol spring
    - Respond to potential nitinol stent suppliers
- Arshiya (Ria) Chugh:
    - Met with the team to review and plan the testing strategy
    - Met with Jesse and Jackie to trim the spring to the required length
    - Investigated double helical springs from Kellogg's Research Lab and submitted a quote request
- Daniel Pies:

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- Drafted testing plan
- Met with team to review/revise testing plan

**Weekly/Ongoing Difficulties:** No notable difficulties.

**Upcoming Team Goals:** Next week the team plans to reach out to the client to schedule the first round of testing and review feedback on the current spring design to determine which length to move forward with. The team will begin testing and collect initial data and results while gathering feedback to guide potential design improvements. The team will also discuss possible prototyping opportunities with Kellogg's Research Lab.

**Upcoming Individual Goals**:

- Allison (Ally) Rausch:
  - Revise testing plan
  - Research testing methods for % stenosis
  - Inquire about potential residents that can participate in ease-of-use testing
- Jackie Behring:
  - Reach out to client to schedule first round of testing
  - Review feedback and limitations of current spring design
  - Confirm which length to continue project with
- Sofia Decicco:
  - Set a date for nitinol spring testing
  - Meeting with client to schedule and confirm testing procedure
  - Organize forms and data sets that will be used to collect data
- Arshiya (Ria) Chugh:
  - Begin testing with the team and collect data and results
  - Gather feedback on the current design and consider incorporating it into design improvements
  - Discuss potential prototyping opportunities with Kellogg's Research Lab
- Daniel Pies:
  - Review testing plan with client and with advisor
  - Finalize prototypes before testing

**Project Timeline**

| **Project Goal** | **Deadline** | **Team Assigned** | **State of Completion** |
|---|---|---|---|
| Initial Research | 1/30 | All | The team will continuously research throughout the semester. |

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|---|---|---|---|
| Preliminary Presentation | 2/6 | All | Complete |
| Preliminary Report | 2/25 | All | Complete |
| Fabrication and Testing | 3/27 | All | In Progress |

**Expenses**

| **Item** | **Description** | **Manufacturer** | **Part Number** | **Date** | **QTY** | **Cost Each** | **Total** | **Link** |
|---|---|---|---|---|---|---|---|---|
| **Component 1** | | | | | | | | |
| Micro-Spring | 5 mm length, 0.5 mm diameter micro-spring | Kellogg's Research Lab | N/A | 02/25/26 | 1 | 12.99 | 12.99 | micro-spring |
| **TOTAL:** | | | | | | | | **$12.99** |