

## Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis

Progress Report 5: 2/26/2026

**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:** Completed and submitted the preliminary report and met as a team to define next steps. Conducted deeper research into limitations of current anastomosis standards and explored alternative design concepts, including microtexturing and a Nitinol micro spring, which has been ordered for evaluation. Expanded vendor outreach with additional quote requests and continued consulting with Jesse to guide feasibility and next design decisions.

**Summary of Weekly Individual Design Accomplishments:**

- Allison (Ally) Rausch:
  - Finished preliminary report
  - Met with team to discuss future goals
  - Researched in depth faults in the current anastomosis standard
- Jackie Behring:
  - Reached out to additional vendors and sent out more quote requests
  - Continuously consulting with Jesse and have been consulting on different solutions
  - Researched and ordered a Nitinol micro spring from Kelloggs Research Labs
  - Completed assigned sections in the preliminary report
  - Began writing test protocols
  - Met with another possible vendor (United Machining) to discuss different manufacturing options
- Sofia Decicco:
  - Researched and ordered a Nitinol micro spring from Kelloggs Research Labs
  - Submitted quotes to additional vendors
  - Completed assigned sections of the preliminary report
  - Met with another possible vendor (United Machining) to discuss different manufacturing options
- Arshiya (Ria) Chugh:

## Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis

Progress Report 5: 2/26/2026

- Began drafting additional design ideas and researching potential designs and vendors
- Worked with the team on the preliminary report
- Researched the effectiveness of microtexturing in stents
- Daniel Pies:
  - Worked with team to complete and submit preliminary report
  - Begin developing test protocols
  - Researched alternative vendor options
  - Met with another possible vendor (United Machining) to discuss different manufacturing options

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

**Upcoming Team Goals:** The team will finalize detailed testing protocols and prepare to execute them in coordination with the client. We will continue refining the design by researching micro scale material geometries, evaluating the usability of the Nitinol spring, and determining the most feasible fabrication pathway. In parallel, we will communicate with vendors to identify a more cost effective stent option and consult with graduate researchers to gather technical insight and guidance.

### Upcoming Individual Goals:

- Allison (Ally) Rausch:
  - Work with team on writing finalized testing protocols
  - Research materials and corresponding geometries on a microscopic scale
- Jackie Behring:
  - Complete testing procedures and schedule client meeting to execute protocols
  - Continue to communicate with vendors looking for cheaper stent option
  - Evaluate spring usability to determine if we should move forward with that route
- Sofia Decicco:
  - Draft testing protocol to evaluate nitinol spring
  - Discuss next steps with client and find a new vendor with better costs
- Arshiya (Ria) Chugh:
  - Meet with the team to finalize the design and outline clear next steps
  - Begin developing detailed testing protocols
  - Correspond with graduate students conducting related research to gather insight and guidance
- Daniel Pies:
  - Refine/validate testing protocols
  - Evaluate spring design feasibility

### Project Timeline

Project Goal	Deadline	Team Assigned	State of Completion
--------------	----------	---------------	---------------------

## Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis

Progress Report 5: 2/26/2026

Initial Research	1/30	All	The team will continuously research throughout the semester.
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	
<b>Component 1</b>									
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>TOTAL:</b>								<b>\$0.00</b>	