

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

Progress Report 4: 2/19/2026

**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 continued reviewing vendor quotes while finalizing the 3D model with the correct dimensions. We met with Jesse to review and confirm the design prior to manufacturing. The stent has been ordered through our selected vendor, and we confirmed with the account manager that fabrication in Nitinol is feasible. Additionally, we selected a journal article and divided the preliminary report sections among the team. We also reached out to the BME 505 Biofluidics professor to inquire about the availability of expired or surplus stents for interim testing while awaiting our prototype.

**Summary of Weekly Individual Design Accomplishments:**

- Allison (Ally) Rausch:
  - Met with the team to discuss journals and preliminary report
  - Researched various testing methods
  - Researched mechanisms to make the stent expandable
  - Researched stent geometries
- Jackie Behring:
  - Continued to review quotes
  - Finalized and designed 3D model with correct dimensions
  - Met with Jesse to review 3D model
  - Ordered stent through vendor and ensured through the account manager that they can create it using nitinol
  - Picked a journal article and split up preliminary report
  - Emailed BME 505 (Biofluidics professor) to check for expired/surplus stent availability
- Sofia Decicco:
  - Narrowed down journal article format and started preliminary report
  - Redraft testing plans according to the stent tolerances we are able to achieve through outsourcing

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- Research idea of scalp clips for stent deployment/adjustability
- Arshiya (Ria) Chugh:
  - Researched journals relevant to the project scope
  - Met with the team to discuss the preliminary report and journal styles
  - Began working on the preliminary report and assigned sections
- Daniel Pies:
  - Conduct research on potential journals for manuscript format
  - Decide on journal and pick sample article to copy format in preliminary report
  - Begin work on preliminary report

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

**Upcoming Team Goals:** The team will model the alternative slit stent design and determine whether to proceed with ordering the prototype. We will finalize and share the completed preliminary report with the client while beginning development of testing protocols. Additionally, we will start designing the loader tube and research PTFE vendors to evaluate material options and pricing.

### Upcoming Individual Goals:

- Allison (Ally) Rausch:
  - Finish preliminary report
  - Search for used stents
  - Continue researching mechanisms for adjustability
  - Continue stent geometry research
- Jackie Behring:
  - Create 3D model of other stent design with slits
  - Possibly order another stent design (slit stent) through vendor
  - Complete preliminary report
  - Begin researching and writing test protocols
  - Begin designing loader tube and research PTFE vendors
- Sofia Decicco:
  - Complete preliminary deliverables
  - Order stent with team and set up future testing times
  - Decide on PTFE or scalp clip mechanisms for stent deployment
- Arshiya (Ria) Chugh:
  - Collaborate with the team to discuss orders from vendor
  - Complete the preliminary report and share it with the client
  - Research PTFE vendors and evaluate pricing
- Daniel Pies:
  - Finish preliminary report sections
  - Further research into loading tube design and material selection

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### Project Timeline

Project Goal	Deadline	Team Assigned	State of Completion
Initial Research	1/30	All	The team will continuously research throughout the semester.
Preliminary Presentation	2/6	All	Complete
Preliminary Report	2/24	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>	