

Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis

Progress Report 7: 3/12/2026

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 focused on refining the testing plan for the project. Research was conducted on methods to assess percent stenosis, quantify leakage during anastomosis, and perform MTS testing using chicken arteries. The testing procedure was reviewed and finalized with the team and advisor, and LabArchives was updated with research notes, training documentation, and team progress updates.

Summary of Weekly Individual Design Accomplishments:

- Allison (Ally) Rausch:
 - Researched methods to assess percent stenosis
 - Updated LabArchives
 - Met with advisor to discuss testing plan
 - Researched pitch and how it affects stent properties
- Jackie Behring:
 - Updated LabArchives with research and training documents
 - Reviewed testing procedure
 - Researched additional testing and testing alternatives
- Sofia Decicco:
 - Finalized testing plan procedure with team
 - Updated LabArchives with individual and team updates
- Arshiya (Ria) Chugh:
 - Worked on refining the testing plan to share with the client and advisor
 - Researched methods for MTS testing using chicken arteries and relevant devices
 - Researched approaches for quantifying leakage during anastomosis
- Daniel Pies:
 - Work on refining testing plan to share with client and advisor
 - Updated LabArchives with completed training documentation

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Weekly/Ongoing Difficulties: No notable difficulties.

Upcoming Team Goals: Next week will focus on initiating testing and coordinating with the client. The finalized testing plan will be shared with the client, testing sessions will be scheduled and executed, and feedback from the client and advisor will be incorporated. The team will also review results, discuss potential design adjustments, and evaluate options such as double or triple helical springs to better mimic nitinol stent behavior.

Upcoming Individual Goals:

- Allison (Ally) Rausch:
 - Attend testing sessions
 - Review testing plan
 - Research common testing methods for stents
- Jackie Behring:
 - Schedule and execute testing procedures
 - Review results and make adjustments to design as needed
- Sofia Decicco:
 - Coordinate testing with the client
 - Consider with team purchasing double helixed or triple helixed springs to better mimic nitinol stent
- Arshiya (Ria) Chugh:
 - Send the finalized testing plan to the client and coordinate testing dates
 - Meet with the team to discuss testing and prepare for upcoming sessions
 - Incorporate feedback from the advisor and client
- Daniel Pies:
 - Receive and incorporate feedback on testing plan from client and advisor
 - Plan sessions for testing with client and assistants to collect data

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	2/25	All	Complete

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Fabrication and Testing	3/27	All	In Progress
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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