Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis
Progress Report 12: 12/4/2025

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

- Leader: Allison (Ally) Rausch
- Communicator: Jacqueline (Jackie) Behring
- BWIG: Sofia Decicco
- BPAG: Arshiya (Ria) Chugh
- 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 worked on the final poster presentation. The team stayed in communication with the client to ensure goal alignment and progress satisfaction. To end the semester, the team has created a mock stent out of stainless steel with dimensions of 3 mm in length, a wall thickness of .009 mm, and an outer diameter of 2.54 mm. This stent will be paired with a PTFE loader tube with a 2.6 mm outer diameter and a length of 5 mm. The team has completed the final poster and will present it to stakeholders on Friday, December 5th.

Summary of Weekly Individual Design Accomplishments:

- Allison (Ally) Rausch:
    - Reviewed client feedback from poster
    - Worked on getting a loader tube for the presentation
    - Worked on final poster and presentation
    - Delivered final presentation
- Jacqueline (Jackie) Behring:
    - Completed assigned sections on poster
    - Reviewed advisor feedback
    - Continued ongoing communication with sales representatives
- Sofia Decicco:
    - Complete round 2 of feasibility testing with clients
    - Summarized feasibility testing on final poster
    - Implement feedback from preliminary report into final report
    - Update lab archives with teams progress
- Arshiya (Ria) Chugh:
    - Met with the team to finalize the poster presentation
    - Reviewed the prior week’s testing results

    - Began assembling content for the final report
- Daniel Pies:
    - Completed Solidworks model for graphics and testing
    - Researched necessary literature values for completing flow and stress modeling simulations for testing data
    - Worked on final presentation

Weekly/Ongoing Difficulties: The team cannot run initial testing on Nitinol as it is expensive and hard to source, especially in small numbers.

Upcoming Team Goals: In the future, the team aims to test the stainless steel stent and then order the nitinol stent. The team will finalize the stent geometry and revise and test the loader tube.

Upcoming Individual Goals:

- Allison (Ally) Rausch:
    - Continue research on stent geometries
    - Write testing protocols and plans
    - Finish final deliverables and notebook
- Jacqueline (Jackie) Behring:
    - Complete assigned sections for the final report
    - Continue communication with the sales reps to prepare for next semester
    - Continue researching fabrication/manufacturing methods
    - Complete final deliverables and finalize notebook
- Sofia Decicco:
    - Work on final deliverable with team
    - Record feedback from preliminary presentations for a direction on next semester's goals
    - Complete group feedback and poster reviews
- Arshiya (Ria) Chugh:
    - Meet with the team to finalize the report
    - Communicate with the client to outline next-semester steps
    - Complete all remaining deliverables
- Daniel Pies:
    - Complete final deliverables
    - Complete personal and team notebook

Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis
Progress Report 12: 12/4/2025

Project Timeline

Project Goal	Deadline	Team Assigned	State of Completion
Initial Research	9/8	All	The team will continuously research throughout the semester.
Product Design Specification (PDS) Draft	9/19	All	Completed
Design Matrix Criteria and Design Ideas	9/26	All	Completed
Preliminary Oral Presentation	10/3	All	Completed
Preliminary Report	10/9	All	Completed
Final Design Selection	10/10	All	Completed
Fabrication and Prototyping	10/16	All	Completed
Testing and Results	11/10	All	Completed
Final Poster Presentation	12/5	All	Completed
Final Report and Deliverables	12/10	All	In Progress

Expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
304 Stainless Steel Tubing	Miniature, 0.12" OD, 0.01" Wall Thickness -	McMaster-Carr	8987K24	McMaster-Carr	8987K24	12/4/25	1	$8.17	$8.17	Link

Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis

Progress Report 12: 12/4/2025

	Length 1'									
304 Stainless Steel Tubing	Miniature, 0.109" OD, 0.012" Wall Thickness - Length 2"	McMaster-Carr	5560K655	McMaster-Carr	5560K655	12/4/25	1	$4.49	$4.49	Link
304 Stainless Steel Tubing	Miniature, 0.1" OD, 0.009" Wall Thickness - Length 1'	McMaster-Carr	8988K23	McMaster-Carr	8988K23	12/4/25	1	$9.93	$9.93	Link
								TOTAL	**$22.59**	